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The invention of a beautiful old age: in search of a freer, happier life

For more than three decades I have been studying the words, behavior and values of Brazilian women based on the results of my research with 5,000 women and men aged between 18 and 98 years.

One of the most interesting findings relates to the relationship between happiness and age. Studies by economists with more than two million people in 80 countries have found a "happiness curve" in the shape of the letter U: happiness is highest in the early years of life, declines over time, reaches its lowest ebb at around 45 years of age, and then begins to grow.

I also found a "happiness curve" among the women I investigated. Those aged between 35 and 45 are the most dissatisfied, frustrated, and exhausted. They complain mostly of a lack of time, recognition and freedom. Some even say they're "missing everything"!

When I asked them what they envy most in men, the most frequent answer was freedom. When I asked what they envy in other women, they said their bodies, beauty, youth, slimness and sensuality. The body type they envied was young, slim and sexual. In Brazil, this type of body is considered a genuine asset.

Brazilian women are among the world's biggest consumers of plastic surgery, botox, facial fillers, hair dye, diet pills, appetite suppressants, sleeping pills and anxiolytics. They are the most dissatisfied with their bodies and those who most frequently stop leaving the house, going to parties and even working when they feel old, fat and ugly.

In *The Beauty Myth*, based on numerous surveys and much statistical data, Wolf[1] describes the most important issues for women. How can we be free if we are prisoners of the idea of a perfect body? How can we be happy if we are permanently exhausted, insecure and dissatisfied with our own bodies? How can we take pleasure in mutilating and sacrificing ourselves to have a young, slim, sexy body? Wolf[1] argues that every woman should have the right to choose how she wants to look and be rather than following the ideals that market forces and the multibillion-dollar advertising industry impose.

It is true that Brazilian women have largely emancipated themselves from the old servitudes of sex, childbearing and dress. Today, however, their bodies are subjected to an increasingly imperative and anxiety-generating aesthetic coercion. They are experiencing a true identity crisis: while they have achieved greater independence and freedom there is also a great degree of control over the female body.

A young body without undesirable marks (wrinkles, stretch marks, cellulite) or excesses (fat, sagging) is the only one that, even without clothing, is considered decently dressed.

But I've found that everything starts to improve after the age of 50 and the happiness curve starts to rise. From this age onwards women begin to feel much freer and happier. Why?

First, they have discovered that time is a true asset and they cannot nor do not want to waste it. Younger women want to please and take care of everyone and complain that they have no time for themselves. Older women, meanwhile, learn to say no and begin to prioritize time to care for themselves. Learning to say no is a true revolution for women.

They also learned to carry out an existential cleansing. Cleansing is not just throwing away clothes that no longer fit, the junk, the things we no longer need. Existential cleansing is to remove those who do us only harm, only criticize, only suck our energy: true emotional vampires.

The women talked a lot about the importance of friends. It is they who care, who listen, who talk, who take them to the doctor, who call every day to find out how they are. When I asked "who will take care of you in old age?" the most common answer was "myself" followed by "my friends". When I asked men the same question they said "my wife, my daughters and my granddaughters".

In my book *Coroas* ("Older Women")[2] I explain how, just like the subjects of my research, I also had a major crisis when I turned 40. For the first time in my life, I went to a dermatologist for moisturizer and sunscreen, things I had never used before. After a brief skin examination, she looked closely at my face and asked: "Why don't you get an eyelid lift? They're very droopy. You'll look ten years younger." Without giving me time to respond, she continued: "Why don't you get some filler around your lips? And botox on your forehead to get rid of the wrinkles? It'll rejuvenate you by ten years."

I paid the expensive bill, which turned out to be even more pricey as it triggered a crisis that lasted almost a year. "Do I get eyelid surgery? And lip filler? And botox on my forehead? If I do everything she tells me, I'll look ten years younger. I'm guilty of getting old. It's my fault!"

I found the best way of freeing myself from the panic of getting old was to learn to laugh at my fears and insecurities. So I wrote *Manifesto das Coroas Poderosas* ("The Powerful Older Women's Manifesto"). In it, I argue that maturity is a phase where we achieve freedom, security, charm, success, recognition, respect, independence, pleasure, self-knowledge and more. We finally have time for ourselves: time to laugh, to dance, to travel, to study, to date, to take care of our health, to enjoy our friends, to be ourselves and not frantically respond to the expectations of others. We can display our bodies without fear of the looks of men and women, without feeling ashamed of our imperfections. We learn that every woman is unique and special[3].

Today, like the women over 60 I studied for my book *A bela velhice* ("A Beautiful Old Age")[4], I can categorically state: "this is the best moment of my whole life. I've never been so happy. It's the first time I can be myself. I've never been so free".

Why, then, must we wait so long to discover that the best recipe for happiness is freedom? And that laughing a lot, especially at ourselves, is always the best medicine?

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Evaluation in distance learning: a case report of the UNASUS/UERJ postgraduate course in elderly health

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Abstract

Objective: this analytical case study aimed to evaluate the effectiveness of the UNA-SUS/UERJ Specialization Course in Elderly Health. *Method:* a mixed-approach evaluation was used, employing the four levels of the Kirkpatrick evaluation model as a reference. *Results*: the UNA-SUS/UERJ Elderly Health Specialization course presented indicators of success in the three proposed levels of the Kirkpatrick evaluation. The variables identified in the study may be related to a change in the practices of health professionals. *Conclusion*: the evaluation of distance learning activities in Brazil is still a developing area, a finding that is of increasing importance as large-scale distance learning specialization courses are established and require financial resources whilst lacking a proposed approach to evaluation. It is believed that the present study can contribute to the development of new evaluation projects in distance learning, especially those that impact the elderly population in Primary Health Care, supporting new distance learning projects in the area of aging and correcting the direction of current initiatives.

Keywords: Education, Distance. Education, Graduate. Primary Health Care. Health of the Elderly. Educational Measurement.

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INTRODUCTION

The care of frail elderly persons is a field of particular importance in the context of population aging, and the impairment of their autonomy and independence demands great attention from health professionals. Dealing with this issue involves actively seeking out at-risk or frail elderly individuals, requiring an extended perspective of care[1].

The National Health Policy for the Elderly (PNSPI) established by Ordinance GM/MS Nº 2.528 dated October 19, 2006, seeks to guide individual and collective measures within the Unified Health System (SUS), re-adapting pre-existing strategies and programs to established guidelines for the care of the elderly. It places the responsibilities for the Family Health Strategy (FHS) within the coordination of the intersectoral care that should be given to the elderly population[2].

The breadth and complexity inherent in aging involve multiple dimensions. These are not immutable, and an intervention in one or more can bring about changes in the configuration of the others, much like in a Rubik's or "Magic" cube as it is popularly known, where a change in one of the 26 cubes automatically influences the positioning of the others[3].

Another challenge arising from this heterogeneity is the need for unique responses based on the identified needs. This requires training and support for health professionals, especially taking into account the creation of strategies of Permanent Education in Health (PEH) in a more extended manner[4,5].

Distance Learning (DL) plays an increasingly important role in attempts to reach more people and reduce costs[6,7]. It has proved an outlet for the promotion of PEH in the SUS, due to its decentralization and the need to approach the development of specific skills in areas of major need in an integral and equitable manner.

As a way of developing PEH strategies for health professionals in the SUS, UNA-SUS employs DL as a teaching modality via new Information and Communication Technologies (ICT)[8]. The permanent education strategy of Primary Health Care (PHC) professionals in elderly health was supported by the partnership of three universities, enabling the creation of the Specialization Course in Elderly Health: the Universidade do Estado do Rio de Janeiro (UERJ), the Universidade Federal do Maranhão (UFMa) and the Universidade Federal do Ceará (UFC). The institutions offered 1,500 places on a specialization course in Elderly Health, distributed equally among the three, representing 390 teaching hours. Such courses are non-mandatory for PHC professionals in the FHS, traditional, Family Health Support Centres (FHSC) and management modalities. These activities aimed to allow students to analyze their practice, through tasks and availability of content in the Virtual Learning Environment (VLE), tutor mediation in chatrooms and discussion forums.

The lack of evaluation activities in DL, which fail to accompany the structure of initiatives in this area and are restricted to the intrinsic assessments of students, has already been described in literature[9]. The process of evaluation of a given EAD strategy must be carried out in a non-linear, critical-reflexive manner using quantitative and qualitative criteria according to the identified objectives[10].

Some models, such as the evaluation of the four levels of the Kirkpatrick Model[11], may be useful to systematize the most appropriate evaluation process for DL activities, particularly in terms of determining the appropriation of knowledge in the practices of the health professional. According to Waddill[11], the methodology of the four levels of the Kirkpatrick evaluation, possesses an advantage over other methods studied as it has already been recognized in literature to evaluate the effectiveness of DL, and offers a flexible method of evaluation, focused on the autonomous construction of knowledge. Kirkpatrick's four levels of evaluation provide a systemic perspective necessary for the analysis of an educational initiative, especially when dealing with a large group representing part of a specific decision-making process[9].

The four levels of Kirkpatrick's evaluation modified by Waddill[11] can be summarized as follows:

- Level 1: Reaction – the perception of the student about the approach to learning offered by the course;
- Level 2: Learning - accumulation of student knowledge with the course;

- Level 3: Behavior - use and form of use of that learned within the course;
- Level 4: Results – the application of the learning to the environment.

It should be noted that each of the Kirkpatrick levels of evaluation involves a cumulative effect in relation to the previous level in the evaluation of the efficiency of the proposed educational model [9].

This article aims to offer an analytical case study using a mixed approach to evaluate the efficacy of the UNA-SUS/UERJ Elderly Health Specialization Course using the Kirkpatrick model.

METHOD

The chosen methodology used a mixed approach, with documentary analysis and evaluation of the final report of the course, based on semi-structured and structured questionnaires completed anonymously by the students, and the keywords of the intervention projects. A total of 444 students were enrolled in the Elderly Health Specialization course, with 319 finishing the course, and 299 keywords were identified from the projects of intervention completed by the students at the end of the course.

The Kirkpatrick four-level model was used as a method of analysis, and the first three levels of analysis were addressed as the variables studied are directly related to the students. The first level involved the analysis of the narratives of the 444 students from the course, with a total of 2,643 comments collected from evaluations made at the end of each module and at the end of the course. All the comments were categorized according to the aspect of the course under evaluation, and more than one aspect could be raised by each narrative, resulting in 2,773 statements for analysis. The variables included positive and negative aspects that could be both inherent or not to the course, as well as suggestions made about such aspects and the carrying out of self-assessment. These variables can be termed as endogenous or exogenous to the course. Among the endogenous variables are technical issues and matters relating to content, material, methodology, tutoring and difficulty with tasks. The exogenous variables identified were related to internet access, personal issues and the expressions of opinions about the course.

Summative assessments, pass rate, and student adherence after the first month of the course were analyzed in the second level of evaluation.

The third evaluation level involved the surveying of keywords from the 299 intervention projects of the students, based on the assumption that such projects emerged from the real life practical situations of the students, in which that learnt during the course allows the students to access and internalize the knowledge they have acquired as they propose an intervention for problems identified in their professional reality. A total of 664 identified keywords were categorized, excluding the terms "health", "elderly health" and "elderly" as these correspond to the specific nature of the area in question. In order to identify the degree of relevance of the categorized words, a visualization strategy based on the repetition of the same in the projects was applied, followed by graphic visualization in a tag or word cloud created using the Wordle™ software package. This feature selects the words that appear most frequently in a text or set of texts, assigning them prominence in size and color.

RESULTS

The results aim to consider Kirkpatrick's first three levels of evaluation through the analysis of questionnaires applied at the beginning and during the course, as well as the pass rates and adherence of the students, ending with an analysis of the degree of relevance of the keywords identified in the intervention projects.

Analysis of Kirkpatrick's first level of evaluation

The analysis of the 2,643 student narratives resulted in 2,774 statements for the evaluation of the endogenous and exogenous aspects of the course (Table 1), as well as the self-evaluations of students, which provided 177 positionings, and the presence of suggestions for the course, which represented 193 positionings.

Evaluations at the end of each module, which included assessment of the activities of the tutors, were also provided by students during the course through a structured questionnaire that analyzed 19 issues related to tutoring (Figure 1).

Table 1. Evaluations of students regarding the Specialization Course in Elderly Health

Variables	Negative Aspects n (%)	Positive Aspects n (%)
Exogenous Aspects		
Opinions of course	1 (0.01)	569 (38.49)
Internet access	35 (3.80)	0 (0.00)
Difficulty with Tasks	223 (24.10)	0 (0.00)
Personal issues	352 (38.10)	0 (0.00)
Endogenous Aspects		
Material	2 (0.03)	156 (10.56)
Tutoring	33 (3.60)	68 (4.60)
Methodology	47 (5.10)	211 (14.28)
Technical problems	56 (6.20)	0 (0.00)
Content	177 (19.24)	474 (32.07)
Total	926 (100.00)	1478 (100.00)

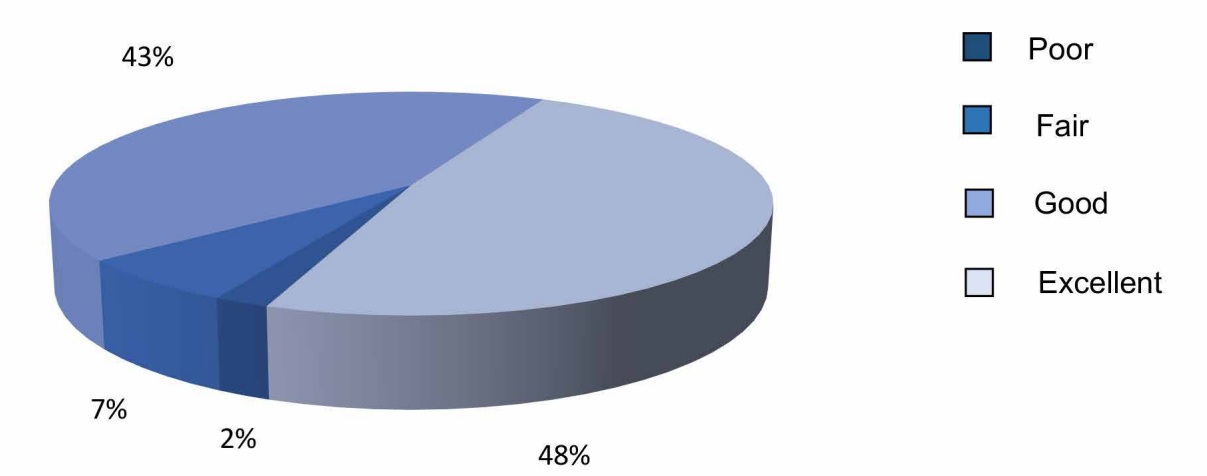

Figure 1. Evaluation of tutor performance by students from the specialization course in elderly health.

Analysis of Kirkpatrick's second level of evaluation

A total of 511 students were enrolled on the course, of whom 67 (13.1%) did not complete the first month or did not access the platform. Another 125 students (24.5%) dropped out sometime after the first month. Of the 319 students who completed the course, 20 (6.27%) failed and 299 (93.73%) completed a final paper based on their own reality, therefore representing project of intervention.

Therefore the retention/permanence rate of the elderly health specialization course was 71.85%, with a pass rate of 93.73%.

Adherence on the course by professional category was also studied, as there were disparities in the number of enrolled students by profession. Figure 2 shows the permanence rate of each professional type, with medicine, social services, pharmacy and nursing achieving adherence rates below the course rates.

Analysis of Kirkpatrick's third level of evaluation

The type of use and understanding of the material learnt on the course was measured by surveying the

intervention projects and their themes, analyzing the title, objectives and keywords of each such project. A total of 67.55% of the objectives involved actions aimed at the elderly population, 23.74% focused on health professionals involved in elderly care, and 8.69% were aimed at management policies for the elderly population.

After the survey and categorization of the keywords of the 299 intervention projects, graphic visualization of the degree of relevance was carried out via a tag cloud based on number of repetitions in the projects. A total of 664 keywords from the intervention projects corresponded to the main topics covered in the course and the working reality of the health professionals (Figure 3).

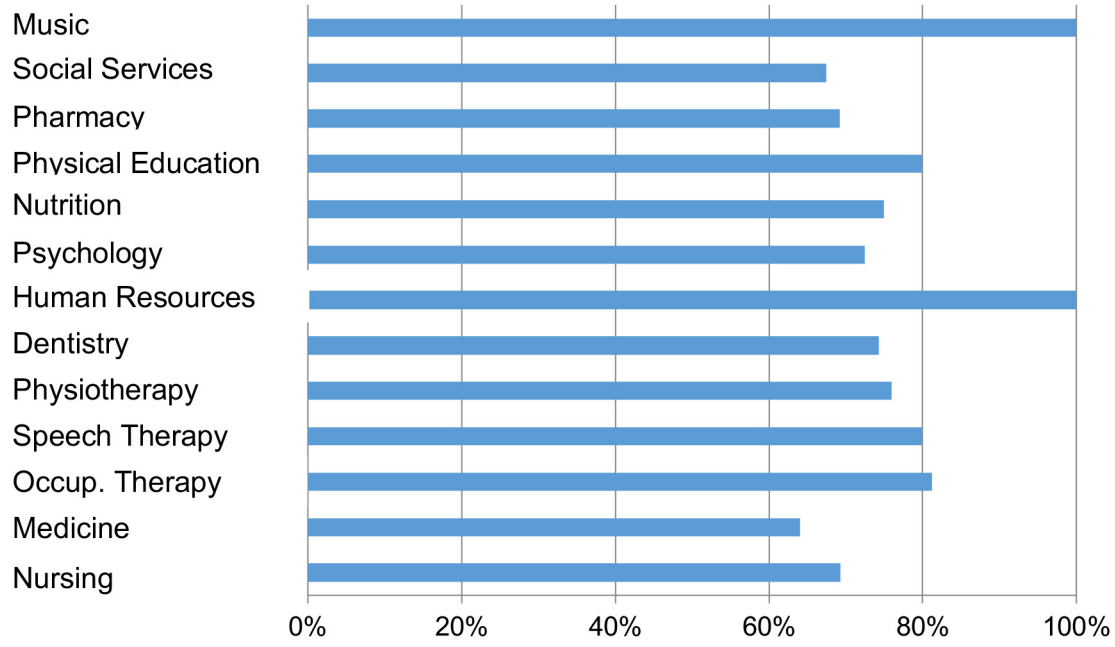

Figure 2. Adherence percentage of specialization course in elderly health by profession.

Figure 3. Keywords from intervention projects of students of specialization course in elderly health based on degree of relevance.

DISCUSSION

Distance Learning (DL) provides benefits to the teaching-learning process by reducing the distance between teachers and students and providing access to new educational technologies which were not previously widely available. As a result, it allows ownership of knowledge in a collaborative and cooperative manner[6].

There remain barriers to be overcome such as access to and use of ICT, as well as the DL tools themselves, which are often not known by professionals who have never experienced distance training[12], corroborating the variables used in the present study.

The case study model for the evaluation of the course in elderly health is supported by literature, as it represents the study of a phenomenon that is contemporary to a real given context, the boundaries of which are not clearly defined[13]. In a mixed model using qualitative and quantitative variables, there is an emphasis on studies with non-oppositional qualitative and quantitative aspects, while in the qualitative models it is possible to evaluate social constructions involved in the process which influence the final result[14].

The evaluation carried out by students throughout the specialization course in elderly health offers a first impression of the main problems and benefits of the course. It was noticed that the positive aspects of the course (61.50%) predominated over the negative aspects described (38.50%). Of the negative aspects most frequently mentioned by students, there was a predominance of difficulties with tasks and their deadlines, in addition to an excess of proposed content, followed by personal problems that prevented or made difficult the progress of the student.

Of the positive issues, students expressed positive opinions (38.50%) but did not provide more specific information. Some specific aspects were mentioned, however, such as good quality of content (32.07%), methodology (14.28%) and material (10.56%). Positive evaluations may reflect the variety of methodologies and materials available to students in discussion forums, chatrooms and the exchange of information and guidelines by email. Themes related to the skills developed by the students were accompanied by activities that sought to encourage a critical approach to the knowledge accumulated through analysis of working practice.

One important finding in the narrative of the students was great difficulty with deadlines over extended public holidays, with descriptions of problems of access to the Internet, the organization of time and a perception of an excess of tasks with short deadlines.

This model of evaluation corresponds to studies of dropout and its causes[15]. The systemic evaluation of the causes of dropout reveals it is related to endogenous and exogenous factors. Evaluating the biopsychosocial dimension of the students themselves, the negative aspects that contribute most to dropouts from the course coincide with those most frequently reported by students, such as health problems, family problems and difficulty organizing time. These variables were categorized as personal questions. Among the aspects endogenous to the course identified, such as methodology, content, material and mentoring, there was a predominance of positive evaluations, which could directly influence student retention/permanence on the course, as demonstrated by Kirkpatrick's second level of evaluation.

The longitudinal evaluation of tutoring that took place in all modules provided interesting findings. Tutors are key players in DL strategies as they act as facilitators by stimulating the critical-reflexive learning of students[16]. The classification of good or excellent performance in 91% of the answers to the 19 assessment questions did not correspond to the majority of the narratives, probably due to differences in relation to the type of questionnaire. There was no guiding question about the work of the tutor in the student narratives, while the specific evaluation of the structured questionnaire meant that the answers were more specific to the variables being studied. It is possible to relate the positive evaluations obtained in the structured questionnaire with the monitoring of the work of the students and the composition of the tutorial body, providing answers directed at the reality of the students, strengthening the educational relationship[16,17].

Aspects considered endogenous or inherent to the course, such as tutoring, should be analyzed throughout its duration to allow the correction of approaches during the pedagogical process, which would also result in lower dropout rates and greater adhesion/permanence[15]. The evaluations carried out in each module by the students not only allowed the correction of possible mistakes observed in the didactic-pedagogical process, but also allowed the development of activities aimed at the common reality of the students themselves.

In studies related to the second level of evaluation, the concept of adhesion/adherence, dropout and retention/permanence should be considered. Adherence is considered part of an initial vision regarding the course while retention/permanence is more appropriate to the longitudinal evaluation of the student in a given initiative, both influenced by the biopsychosocial factors of the students themselves, such as their life history and ability to adapt. The complexity of this evaluation is in the connection of the aspects developed during a didactic-pedagogical initiative in a given institution, that is, it makes the concept extremely dependent on the adopted strategy[13].

It is also worth noting the need to study dropout at various periods in a given DL initiative. It is noticed that in the first weeks of a DL course, especially in the orientation weeks of online classes, the dropout rate of the students is twice that of face-to-face classes, although the variables that directly affect the decision of students are not identified[15]. The same difference between DL and face-to-face courses does not occur over the duration of the course, however. This model agrees with one of the definitions of dropout raised in a review of the topic, where it is defined as a student abandoning the course before its completion, despite having acquired knowledge or having reached his or her personal goals[18]. This definition leads to questions about how long it takes to acquire some degree of knowledge in a DL initiative. It should be remembered that the first weeks of a course involve issues relating to DL itself as well as agreements on activities, knowledge and the group setting and even adaptation to ICT. In this way, it is important to consider the degree of dropout after the first month of activities.

Studies show a dropout rate of around 57.80% for courses with a similar target audience, as well as dropout rates of around 49.00% to 58.00% in postgraduate courses with more than one stage. It should be noted that courses with collective construction spaces in the form of team meetings when carrying out activities have even lower dropout rates, of around 19.7%[19].

When compared with studies of dropout rates in specialization courses in family health employing face-to-face and distance modalities, the rates of the specialization course in elderly health remained below the average (28.15%), sometimes reaching half that observed in the literature[19].

The analysis of the third level of evaluation, identifying changes in the behavior of the health professional when caring for the health of the elderly, was measured by identifying the themes contained in the intervention projects. The elderly population was the target of 67.55% of the planned actions, while the health professionals themselves appeared in 23.74%, representing a multifaceted and interprofessional approach as shown by the words contained in the tag cloud.

The change in practice observed through the intervention projects translates into a new paradigmatic vision in the educational process with changes in health strategies, aimed at a transformation of reality through the re-signification of know-how and learning in health, resulting in improvements in the SUS itself[20].

The use of innovative tools for content evaluation has already been described in literature, such as the use of word clouds for the qualitative analysis of a digital portfolio, especially in the pedagogical training of preceptors in the area of health in the residence programs of the Hospital Universitário Pedro Ernesto[21]. Some studies have used word clouds to evaluate the titles of scientific papers, identifying the most prominent terms and excluding words that form part of a certain context[22]. This analysis strategy, together with quantitative aspects, allowed the evaluation of the changes in the focus of studies on DL or in new ICT[21].

One of the greatest advantages of the tool is that it both facilitates the visual presentation of information

and improves memorization through the use of an image. According to Afonso et al.[21]:

"The use of this tool in courses that are based on the reflexive critical pedagogical model is extremely important due to the potential for the immediate reorganization of the teaching strategy according to the performance of the participants. It is also worth mentioning the contribution of this analysis to immediate feedback, a fundamental strategy in the evaluation of quality."

Using this tool to evaluate the keywords found in the intervention projects allows assessment of the incorporation of knowledge into the critical-reflective universe of the student. It should also be noted that as these final projects involve a proposed intervention, the words featured are not unconnected to reality, but instead are interlinked with meaningful learning leading to a change in the professional practice of students and consequently in their professional reality.

CONCLUSION

Evaluation is necessary as it promotes a reflexive process of a certain practiced action, with a view to inducing procedural changes, achieving results that correspond more directly to the needs observed by students, the institution and society, building and re-signifying knowledge in a continuous, daily and shared manner[23]. Therefore, a Distance Learning approach in Primary Health Care should focus on the organization of the Unified Health System[24] itself in the sense of continuous assessment capable of supporting health professionals in reflections on their work process.

Documentary analysis and analysis of the intervention projects of the students of the specialization course in elderly health using Kirkpatrick's levels of evaluation suggested that the experience of the course was successful in terms of variables inherent to the course itself, its content and its didactic-pedagogical approach.

The qualitative analysis of the responses to the semi-structured questionnaires carried out during the course by the students suggests an agile response on the part of the pedagogical team, as well as close interactions with the tutors demonstrated by the degree of satisfaction with the tutoring activities, responding to the responses of the students in an effective way, which is described in literature as fundamental for a positive student respons[16,17,25].

The aspects highlighted by the students in the narratives of their semi-structured questionnaires included content, allowing the inference that not only did tutors present specific training in the area of geriatrics and gerontology, but also maintained a close relationship with the pedagogical team and with teachers of content, as the feedback given to the student was positively evaluated in the narratives.

Although few dropout studies have been aimed at post-graduate courses in Distance Learning, it is noteworthy that even when using more rigid dropout criteria, considering all enrolled students irrespective of whether they entered the virtual platform or not, the specialization course in elderly health had a dropout rate of 38%, lower than expected for distance learning courses aimed at the same public[19]. Another key aspect was the high pass rate of around 94%, resulting in 299 intervention projects aimed at the health professional.

There were also indications of changes in the behavior of the graduating students, demonstrated by the analysis of the structured intervention projects and the themes pertinent to the area of action of the students, focused on the health of the elderly.

One of the limitations of the present is that it does not consider the impact of intervention projects developed by the students in their working reality. From this perspective the fourth level of the Kirkpatrick evaluation could be used to highlight the added value to society of a given educational program, and the application of Kirkpatrick's four levels of evaluation, of which the present study employed only the first three, would represent a valid evaluation methodology. However, it should be noted that this analysis must be carried out in an interconnected and systemic manner, where the variables studied in the first level from the impressions of the students in the semi-structured questionnaires can also explain the aspects of adherence and dropout evaluated in the second level, for example. The systemic approach promoted by this evaluation would allow the cause-effect relationship to be exchanged for an analysis

where qualitative aspects could influence quantitative evaluations, such as in dropout studies. It also allows that dropout can be explained from the perspective of the recognition of the internal or external factors of the course, which influence its final outcome.

Directing resources towards educational initiatives in areas of fragility can have an impact on the population and the health professionals themselves. The application of Kirkpatrick's fourth level of evaluation to this perspective could identify the added value to society of a given educational program, as it allows the evaluation not only of the application of intervention projects in the practice of health professionals, but also the results of their use in a local context.

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Elderly persons who live alone in Brazil and their lifestyle

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Abstract

Objective: to assess the prevalence of elderly persons living alone in Brazil, based on covariates of health status, behavior and socio-demographic characteristics. *Method*: data from 11,967 individuals (aged 60 or over) were obtained from the National Health Survey (Brazil, 2013). Living alone was defined as residing in a one-person household. The prevalence of individuals living alone was stratified by socio-demographic conditions and geographic region. Living alone was also assessed as a factor for outcomes of physical functioning, behavior and health conditions. Poisson regression models were used to evaluate the prevalence ratios and a 95% confidence interval was applied. *Results*: in Brazil, 15.3% of people aged 60 years and over live alone. This condition is more prevalent in higher income regions; however, more lower-income individuals were affected. Prevalence was higher among women and individuals aged 75 years or more. Living alone was associated with difficulties in instrumental activities of daily living (prevalence ratio 1.15; 95% confidence interval 1.04-1.28); the reporting of an illness in the two prior to the study (PR=1.35; 95%CI=1.16-1.57); watching television (five or more hours daily) (PR=1.40; 95%CI=1.26-1.56) and falls in the previous year (PR=1.35; 95%CI=1.10-1.66). Elderly persons living alone also had worse eating habits, with a less frequent intake of meat, beans and salads than their counterparts who lived with others. *Conclusion*: elderly persons living alone in Brazil have a worse health status and health-related habits. These findings represent a challenge and should motivate social and health policies aimed at fulfilling the greater needs of adults who grow old alone.

Keywords: Housing. Health Status Disparities. Epidemiology.

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INTRODUCTION

Like other middle-income countries, Brazil has undergone an accelerated process of population aging in recent decades. This transition is directly related to the reduction in infant and child mortality throughout the twentieth century, as well as to a decline in fertility and an increase in life expectancy since the 1950s[1].

Households that include elderly persons are expected to provide the first nucleus of social interaction and support for such individuals, thus influencing their access to goods and resources. Poor housing conditions and disorganized households have been reported as contributing to the risk and progression of disability[2]. As new paradigms related to aging have emerge, the large number of people that live alone is considered to be one of the most important changes in contemporary societies[3].

The present study was motivated by the perception of changes in household arrangements that have followed the accelerated process of aging in Brazilian society. Population projections estimate the proportion of elderly persons in Brazil in 2050 to be higher than the global average[4]. Despite this fact, the country continues to make slow progress towards providing adequate social protection in old age.

Family organization is dynamic, and household arrangements have changed over time in consonance with social change. A growing contingent of elderly persons has opted to or been induced to live alone. The increase in longevity and the historical decline in fertility, which are characteristics of demographic transition, have resulted in new patterns of behavior, new living arrangements, and prolonged periods of widowhood without the company of family members. These changes have resulted in a large number of elderly persons with few or no close family members, while the proportion of one-person households in Brazil has grown since the 1970s[5].

Growing old while living alone (defined by living in one-person households), without the support of close kinship, can be associated in different ways with various health outcomes, including death[6]. It has been reported in several sizeable longitudinal assessments that loneliness and a lack of personal networks are associated with mortality risk[7-10]. In any case, the prospects for the household arrangements of elderly persons in Brazil is uncertain. Few studies have assessed this theme, resulting in the lack of a clear depiction of their needs and potential demand for health services and social support[3,11].

The objective of the present study was to describe the elderly persons living alone in Brazil and how they live, in terms of specific features of their health profile.

METHODS

Population and study design

This cross-sectional study assessed information collected by the National Health Survey of the Ministry of Health and the Brazilian Institute of Geography and Statistics in 2013. A probabilistic sample was employed to allow statistical inference for the whole country and each of its five geographic regions. The sample was stratified into clusters in three stages: census tracts (the primary sampling units), households and individuals. A previous report provided more extensive information about the sample design, sample size calculation, and weighting[12].

A total of 64,308 individuals aged 18 years or older were interviewed between August and November 2013, corresponding to a response rate of 86%. Questionnaires were applied during household visits by specially trained interviewers. The study exclusively considered information related to individuals aged 60 years or older (N = 11,967). The survey observed international guidelines on ethics in research involving human subjects. Participants signed a consent form, and the National Research Ethics Committee approved the project in June 2013 (No. 10853812.7.0000.0008).

Variables

The present study assessed the prevalence of old people living alone, defined as individuals aged 60 or over residing in one-person households. This condition was the primary variable of the study.

Brazil has five geographic regions, with the north and northeast the poorest; their per capita gross domestic product is nearly half that of the remaining regions.

Socio-demographic information was collected (gender, age group, ethnicity/skin color, schooling, and per capita income). The classification of ethnicity/skin color observed standards used in censuses carried out in Brazil, with self-reported information on the following categories: white (European descent), brown (mixed race), black (African descent), yellow (Asian descent) and indigenous. In Brazil, less than four years of formal education represents insufficient schooling; eight years corresponds to a complete elementary education; eleven years corresponds to a complete secondary education; fourteen years represents a university education. Income was classified by tertiles, according to an OECD equivalence scale that divides household income by the square root of the number of residents of the household[13].

Regarding health conditions, the interviewer asked whether a doctor had ever diagnosed hypertension, diabetes, high cholesterol, coronary heart disease, stroke, asthma, arthritis or rheumatism, spinal problems, work-related musculoskeletal disorders, depression, other mental illnesses, chronic obstructive pulmonary disease, cancer, kidney failure or other chronic diseases. Responses were classified according to the number of diseases reported. The prevalence of hearing loss and physical disability (paralysis, amputation, deformity, motor deficiency, ostomy, and dwarfism) were also registered. The variable "disease in the previous two weeks" was assessed by asking if the informant had stopped performing any of their usual activities due to health reasons during that period.

The questionnaire included information on functional disabilities. Basic activities of daily living comprise the ability to feed or bathe oneself, use the bathroom, dress, walk indoors and get up from the bed or a chair[14]. Instrumental activities of daily living comprise the ability to buy food, take care of money, go to the doctor, take medicines or use transportation[15]. Each of these activities has the following options: (i) without difficulty, (ii) a little difficulty, (iii) great difficulty, and (iv) failure to perform. The dichotomous classification of responses considered option (i) as "no," and the remaining options as "yes," as suggested by Espelt et al.[16]. The questionnaire also recorded the use of a walking stick, the occurrence of falls in the previous year and participation in social activities organized by religious or social groups, clubs, social centers for the elderly and others.

Behavioral characteristics included indicators of dietary patterns (consumption of beans and salad every day, meat five or more times per week) and the habit of watching television for five or more hours a day.

Statistical analysis

The distribution of elderly persons according to the variables of interest was described and the association between these variables was analyzed. The prevalence of individuals living alone was assessed as an outcome according to geographic region and the socio-demographic factors of the analysis. The prevalence of elderly persons living in one-person households was considered a factor in the assessment of outcomes related to health conditions, functional disabilities and behaviors.

Poisson regression models were used to evaluate prevalence ratios and their respective 95% confidence intervals. Confidence intervals encompassing values greater than one indicate that the comparison group had a higher prevalence than the reference value. The inverse occured when confidence intervals encompassed values lower than one. Complementarily, there was no statistically significant association when the confidence interval encompassed the unit.

All analyzes were conducted using Stata 14 (College Station, TX, USA, 2015) software, taking into account the complex sample design and sample weights.

RESULTS

The proportion of elderly persons living alone in Brazil was 15.3% (14.4%-16.2%, 95% confidence interval) in 2013. This proportion varied geographically, with the more affluent portion of the country (the south, southeast and center-west

regions) having higher figures than the poorer north and northeast regions (table 1).

The prevalence of elderly individuals living in one-person households was 29% higher among women than among men. This condition was also more prevalent among older elderly persons, affecting nearly one out of every five individuals aged 75 years or older (p <0.001). No significant difference occurred across racial strata and education levels. However, the assessment of income distribution showed a significantly higher proportion of individuals living alone among the most deprived tertile (table 2).

Table 1. Who are they? Prevalence of elderly persons living alone in each geographic region. Brazil, 2013 (N=11,967).

Geographic region	Prevalence	PR[1]	95% CI[2]	*P*
Southeast	15.9	1.00		
South	17.8	1.12	0.97-1.30	0.132
Centre-West	15.4	0.97	0.82-1.14	0.721
North	11.9	0.75	0.60-0.94	0.013
Northeast	13.3	0.84	0.73-0.97	0.017

[1] Prevalence ratio; [2] 95% Confidence Interval.

Table 2. Who are they? Prevalence of elderly persons living alone according to socio-demographic characteristics. Brazil, 2013 (N=11,967).

Socio-demographic characteristics	Prevalence	PR[1]	95% CI[2]	*P*
Gender				
Female	17.0	1.29	1.14-1.45	<0.001
Male	13.2	1.00		
Age				
60-64	11.5	1.00		
65-69	15.3	1.33	1.13-1.57	0.001
70-74	15.5	1.35	1.13-1.62	0.001
75 or more	20.0	1.75	1.49-2.04	<0.001
Ethnicity/skin color				
White	15.6	1.00		
Brown	14.9	0.95	0.84-1.07	0.428
Black	15.2	0.97	0.78-1.20	0.775
Yellow	14.5	0.93	0.55-1.55	0.768
Indigenous	16.2	1.04	0.51-2.09	0.923
Years of study				
0-3	15.2	1.00		
4-7	14.7	0.96	0.84-1.11	0.620
8-10	16.9	1.11	0.92-1.34	0.268
11-13	15.3	1.00	0.83-1.21	0.970
14 or more	15.5	1.01	0.83-1.25	0.889
Income				
1st tertile	23.0	2.06	1.78-2.40	<0.001
2nd tertile	11.8	1.06	0.90-1.25	0.488
3rd tertile	11.1	1.00		

[1] Prevalence ratio; [2] 95% Confidence Interval.

The assessment of health conditions revealed important differences between elderly individuals who lived alone and their counterparts who lived with family members or others. The prevalence of people who stated they had suffered from illness in the two weeks prior to the study was nearly one third higher among the former than the latter group (PR: 1.35, 95% CI 1.16-1.57). No significant difference was observed between the two groups in terms of number of chronic diseases, nor in the prevalence of any chronic diseases, except for arthritis or rheumatism, with a worse profile for those living alone (PR: 1.18, 95% CI 1.03 -1.36). Furthermore, elderly persons who lived alone had a significantly higher prevalence of hearing loss (PR: 1.57, 95% CI: 1.27-1.93) (table 3).

When considering functional mobility, the prevalence of difficulties in activities of daily living (ADL) (p = 0.211) and the use of a walking stick (p = 0.155) did not differ significantly between elderly persons who lived alone and those who lived with others. However, the first group had a significantly higher prevalence of self-reported difficulties in instrumental ADL (PR: 1.15, 95% CI: 1.04-1.28) and falls during the previous twelve-month period (PR: 1.35, 95% CI: 1.10-1.66) (table 4).

The assessment of behavioral characteristics depicted better dietary patterns among elderly persons who lived with others than among those who lived alone. The former group included a significantly higher proportion of individuals who ate beans (p<0.001) and salads (p=0.045) on a daily basis, and who ate meat five or more times per week (p=0.019). In terms of watching television for five or more hours each day, which is considered detrimental sedentary behavior, the prevalence was 40% higher among those who lived alone (PR: 1.40, 95% CI: 1.26-1.56) (table 5).

Table 3. How do they live? Prevalence of health conditions among elderly persons living alone and living with others. Brazil, 2013 (N=11,967).

Health conditions		Living alone	Living with others	PR[1]	95% CI[2]	p
Any disease in the previous 2 weeks		15.0	10.9	1.35	1.16-1.57	<0.001
Chronic diseases	One	24.0	26.0	0.92	0.85-1.01	0.076
	Two or more	52.4	52.7	0.99	0.95-1.04	0.228
Hypertension		49.1	51.5	0.95	0.89-1.02	0.164
Arthritis or rheumatism		18.9	16.0	1.18	1.03-1.36	0.021
Physical disability		3.4	3.5	0.97	0.68-1.39	0.872
Hearing loss		11.6	7.4	1.57	1.27-1.93	<0.001

[1] Prevalence ratio; [2] 95% Confidence Interval.

Table 4. How do they live? Prevalence of functional disabilities among elderly persons living alone and living with others. Brazil, 2013 (N=11,967).

Functional disabilities	Living alone	Living with others	RP[1]	IC 95%	p
Difficulties in basic ADL[2]	16.7	15.3	1.10	0.95-1.26	0.211
Difficulties in instrumental AIVD[3]	30.4	26.3	1.15	1.04-1.28	0.007
No social activities	71.7	75.5	0.95	0.91-0.99	0.012
Falls (in the last year)	9.5	7.0	1.35	1.10-1.66	0.004
Use of walking stick	10.1	8.8	1.15	0.95-1.40	0.155

[1] Prevalence ratio; [2] Basic activities of daily living; [3] Instrumental activities of daily living.

Table 5. How do they live? Prevalence of behavioral characteristics among older individuals living alone and living with others. Brazil, 2013 (N=11,967).

Behavioral characteristics	Living alone	Living with others	PR[1]	95% CI	p
Eat beans (every day)	49.2	61.0	0.81	0.76-0.86	<0.001
Eat salad (every day)	37.3	40.9	0.91	0.83-0.99	0.045
Eat meat (5 or more times per week)	29.4	33.4	0.88	0.79-0.98	0.019
Watch television (5 or more hours per day)	31.2	22.2	1.40	1.26-1.56	<0.001

[1]Prevalence ratio.

DISCUSSION

The main results of the present study are that the elderly persons who live alone in Brazil are mostly women, deprived and older elderly individuals, who live in the more affluent regions of the country, and have poorer dietary habits, greater health needs, and more sedentary behavior.

Who are they?

In Brazil, lower-income individuals are choosing to or being forced to live alone during old age. Curiously, this pattern mostly affects the wealthier geographic regions of the country. The south and southeast had a higher proportion of old people living in one-person households than the poorer regions of Brazil. These regions also have a higher human development index, life expectancy and proportion of elderly people. Almost 18% of the population of the southern state of Rio Grande do Sul, for example, is aged 60 or over; whereas some northern states (such as Roraima and Amapá) have poorer socioeconomic indices, and the elderly make up only 8% of the overall population[4].

Geographic differences in the demographic transition and the consequent higher proportion of old people in the population to some extent reflect the historical process of the occupation of Brazil over consecutive economic cycles. The wealthier Brazilian regions received a higher influx of immigration, both from abroad and from other Brazilian states, and encouraged industrialization and public services[17]. These conditions provided improved conditions of social security and retirement, as well as opportunities for elderly individuals to remain in the labor market[18]. Notwithstanding the greater proportion of elderly persons who live alone in prosperous regions, results reported here suggest that better-off individuals try to avoid living alone, even in prosperous regions.

It was also found that women and older elderly persons are more likely to live alone than their respective counterparts. The elderly population in Brazil is mostly composed of women, with their percentage participation tending to increase among older groups[1]. However, the increased proportion of women among the elderly population and the higher likelihood of elderly women living alone have also been found in other countries. Margolis and Verdery[11] obtained similar results when assessing country-wide information in the US. In Europe, the proportion of elderly women who live alone also had a socioeconomic gradient, ranging from 24% in Cyprus to more than 45% in Norway, Finland, and Denmark[19].

How do they live?

It was noteworthy that the prevalence of chronic diseases did not differ significantly between elderly persons who do and do not live alone; the same was found for physical disability, difficulties in basic activities of daily living and use of a walking stick. Sixsmith et al.[20] stated that living alone can be an opportunity for greater self-knowledge and closer social ties outside the home environment, and it is reassuring to find that elderly individuals

who live alone are not subject to a poorer profile of severe conditions. Living alone may have some attractive characteristics, though it demands certain strength and physical capabilities. Failing to fulfill these requirements may put the individual at a disadvantage, eventually overloading social services in terms of the long-term care and support they provide for the elderly.

Despite the relatively homogeneous distribution of chronic diseases among those who do and do not live alone, the present study found that the former had a poorer epidemiologic profile in terms of less severe conditions. More individuals who lived alone complained of a lack of social activities and of having been ill during the last previous weeks. They also had a higher prevalence of hearing loss, arthritis or rheumatism, and difficulties in instrumental activities of daily living. These findings draw attention to the more extensive health needs of this population segment, which should serve as a warning to the health authorities.

A nationally representative panel study of elderly persons in the US, the Health and Retirement Study 2015, also depicted a higher prevalence of disabilities among those who lived alone, in terms of instrumental activities of daily living[2]. Authors interpreted the reason for this as the fact that having a live-in partner may provide supportive resources for a healthier and more affluent life. Most solitary elderly persons in Brazil, like in the US, cannot rely on functional household arrangements. For those individuals, the health system may be required to supply additional services to fulfill their more extensive needs.

The results of the present study showed a significantly higher prevalence of hearing loss among elderly persons who lived alone. Previous studies have also reported the association between hearing impairment and social isolation[21-23]. A complex interplay is involved in this association as both conditions can influence the other, and they also reflect a lack of communication ability. This finding reinforces the need for closer attention to this population.

Elderly persons who live alone presented worse dietary patterns than those who live with others. Brazilian society has undergone a process of nutritional transition[24], mainly through the large-scale insertion of junk food in the daily menu of the population. Many studies have reported the increased consumption of ultra-processed foods in place of a more traditional diet, based on vegetables and minimally processed foods, which are a standard feature of the Brazilian food dynamics[25,26]. The current study suggests that this transition may have already reached the elderly, especially affecting those who live alone.

Limitations and strengths

The use of cross-sectional data - which cannot infer causality or temporal relationships between factors and outcomes - and relying on the self-reporting of the participants – with no registered information available - are the main limitations of this study. One of its strengths, however, is the use of a large sample, which was specifically designed to be representative of the country as a whole and each of its five geographic regions. A further strength is the setting of specific targets for the planning of health services aimed at this population group.

CONCLUSION

The present study described the prevalence of elderly persons living alone in Brazil, according to sociodemographic characteristics and the geographic region of residence. It also described the greater likelihood of elderly persons who live alone having a worse profile in critical outcomes in health status, physical functioning, and behavior. The information reported here is relevant for health policy and planning, as finding solutions for the functional decline in old age is a current need in many countries, and a task that becomes even more challenging in the context of loneliness. Healthcare strategies should consider providing surrogate social services to compensate for the absent familial support of solitary individuals in old age.

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Falls and associated factors among elderly persons residing in the community

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Abstract

Objective: to identify the prevalence of falls among elderly persons and analyze fall-related factors. *Method*: a cross-sectional, population-based study conducted by household survey of 400 elderly subjects (aged 60 years or older) living in the city of Juiz de Fora, Minas Gerais, Brazil was carried out. The occurrence of falls in the last 12 months, sociodemographic factors, health profile and geriatric syndromes were observed. The crude and adjusted prevalence ratios (PR) were obtained using Poisson regression. A three-model hierarchical approach was applied in the multivariate analysis. In all the multivariate models, gender and age were defined as confounding variables. Variables which reached a level of $p<0.05$ in the first model were retained in the subsequent models. For all models the significance threshold was set at 0.05 and the variables which remained associated with the occurrence of falls in the 3rd model were retained in the final analysis. *Result*: the prevalence of falls was 35.3% (CI 95% = 30.7;40.0). Among the elderly persons who reported falls, 44% reported that they had fallen more than once. The majority of falls occurred at home (69.2%) and in the morning (46.7%). Age a reported difficulty walking remained significantly associated with the outcome after adjustments (3rd model). *Conclusion*: falls are frequent and are associated with increasing age and difficulty walking. The recognition of these factors is important for strategies to reduce falls and the promotion of a healthy aging by means of preventive and rehabilitation actions that target more vulnerable groups.

Keywords: Elderly. Accidental Falls. Risk Factors. Cross-Sectional Studies.

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INTRODUCTION

The growth of the elderly population has created a number of important challenges, such as falls, which are considered a serious public health problem as they affect a large number of elderly people, have significant morbidity and mortality rates and impose a high social and economic cost. They can result in a decline in the functional capacity and quality of life of the elderly and an increased risk of institutionalization[1-9]. While these events are preventable, one alarming statistic stands out: around one third of individuals aged 60 years or over fall at least once a year[1,3–6].

Falls can result in mild bruising, soft tissue injuries (such as bruises or lacerations), fractures, severe injuries or trauma with or without neurological injury, a need for hospitalization and even death[1,2,7,8,10]. They can also have social and psychological consequences, such as sadness, depression, fear of falling and behavioral changes with a reduction in physical and social activities[2,7,8,10]. Literature describes the existence of a post-fall syndrome characterized by the loss of autonomy, dependence, isolation and depression, a certain degree of immobilization and consequently a greater restriction of daily activities, creating a vicious cycle[1–3,7,8,10].

The identification of factors associated with the occurrence of falls is important for the formulation health prevention and promotion measures, as it allows the identification of the most susceptible segments of the population with the concrete aim of reducing these events and secondary complications. The objective of the present study was therefore to estimate the prevalence of falls in the elderly and to analyze the associated factors.

METHOD

A cross-sectional study was carried out between October 2014 and March 2015 by means of a household survey, with a sample of 400 elderly persons, aged 60 years or older, living in the North Zone of the city of Juiz de Fora, Minas Gerais (MG), Brazil. This study is part of a larger research project called the Health Survey of the Elderly Population of Juiz de Fora, involving two phases of population-based multidimensional domiciliary surveys (2010/2011 and 2014/2015).

Participants from the first phase of the survey were selected using a multi-stage stratified and randomized sampling process. The primary sampling units were the census tracts. For the drawing of lots, the sectors were grouped into strata defined based on the different modalities of health care to which the population of the sector was assigned, subdivided into Primary Health Care (Family Health Strategy or traditional); Secondary Care and uncovered area. The selection of census tracts was carried out with probabilities proportional to their size (resident population according to data from the Demographic Census 2000) independently in each stratum.

In order to calculate the size of the sample of elderly persons, we considered the prevalence of those who fell at a national level, according to literature, estimated in previous studies as approximately 30%[3,6]. A maximum error of 5% was also applied, along with a 95% confidence level, a correction for finite populations, a sample design effect equal to 1.5 (considering possible stratification and cluster effects, according to the selection process adopted) and possible losses through refusal of approximately 30%.

For the second wave of the survey (2014/2015), the calculation of the sample size was estimated from the data from the previous study and from the results of the 2010 IBGE census relating to the population of the defined area, at the level of census sector disaggregation. There were changes in the population quantitative and distribution of these sectors, which required the resizing of the representative probabilistic sample based on stratification and clustering. In order to neutralize the loss of panel members, who were no longer part of the population surveyed following the years elapsed, the "over sample" method was used, allowing the maintenance of the initial sample, provided that the initial population is known and that the statistical treatment and weighting assignment differs between the groups that make up each situation of loss of the panel member (cases of death, change of address where identification of new address is not possible, long trips away, prolonged hospitalization and entry into a long-term facility)[11]. Age, gender and level of education were selected as variables to define the

entry of new subjects. Thus, 248 elderly persons from the first phase of 2010 and 175 new elderly persons (a total of 423 elderly persons) made up the 2014 sample. To respect the sample process, non-institutionalized individuals aged 60 years or older of both genders who were residents of the North Zone of Juiz de Fora, Minas Gerais were included.

The Mini-Mental State Exam (MMSE) was used as a screening tool for cognitive decline, which determined whether another respondent was required. Where another respondent was needed, the questions based on the self-perception of the elderly were not addressed. Researchers state that level of schooling influences performance in the MMSE and adopting stratified cutoff points decreases diagnostic failures, as the schooling of the Brazilian population is diversified and the educational level of the majority of the elderly population is low[12]. However, there is no consensus on the cutoff points to be used in Brazil[12].

The cut-off point used by the Minas Gerais State Health Department, which makes use of this instrument for the evaluation of the elderly, was therefore adopted[13]. The minimum expected score for elderly persons with four years or more of schooling is 25 points, while for those with less than four years it is 18 points. Lower scores are indicative of cognitive decline. Individuals who presented behavior suggestive of cognitive decline and who were not accompanied by family members and/or caregivers were excluded (N = 23).

The question used to test the outcome variable was: "Have you fallen in the past year?" To support this question, a fall was defined as an accidental event that results in the change in the position of the individual to a lower level, relative to their initial position, with the inability to correct this change in a timely manner and landing on the ground. It results from a total loss of postural balance, due to the sudden insufficiency of the osteoarticular and neural mechanisms essential for maintaining posture[14].

The independent variables included demographic and socioeconomic conditions, health conditions and geriatric syndromes. The questionnaire used to verify the sociodemographic profile and health issues of the elderly was standardized and pre-tested. The Patient Health Questionnaire-4 (PHQ-4) was used to assess anxiety and depression disorders; the Falls Efficacy Scale - International - Brazil (FES-I) to evaluate fear of falling; the Edmonton Frail Scale (EFS) to verify frailty; and the Lawton and Brody Scale to evaluate functional capacity for the performance of instrumental activities of daily living (IADL).

Intra- and inter-examiner agreement found before the start of data collection was substantial or excellent (>75%). During the study the interviewers were monitored, evaluated and refreshed. For the control of the quality of information, field supervision was carried out by the main researchers and around 10% of data production was reevaluated by a further partial interview at the end of data collection.

The data were processed in a database created using Stata software (SPSS) version 7.0, which allows the characteristics of the sample plan to be considered, with a significance level of 5% ($p \leq 0.05$). These data were submitted to descriptive analysis for the extraction of the absolute and relative frequencies of the variables analyzed, as well as the prevalence of the outcome investigated. Crude and adjusted prevalence ratios (PR) were obtained, estimated by Poisson regression.

The theoretical hierarchical approach was used for multivariate analysis[16]. The first model included the demographic and socioeconomic variables (education, ethnicity/skin colour, socioeconomic level according to the Brazilian Association of Research Companies classification, marital status, household arrangement). The second model incorporated the health conditions (presence of reported morbidity, difficulty walking, need for assistance with locomotion, number of medications in continuous use described, presence of caregiver, self-perception of health, anxiety and depression disorders). The third model included geriatric syndromes (Frailty Syndrome, Fear of Falling and Functional Ability to perform IADL). Variables with $p<0.05$ in the first model were retained in the subsequent models, and then for the subsequent levels. Those that remained associated with the occurrence of falls ($p<0.05$) in the third model were retained in the final analysis (considered to be independently associated with the event). Gender and age were considered *a priori* confounding variables in the study and were retained in all the multivariate models.

The Directives and Guidelines Regulating Research Involving Human Beings were followed, in accordance with the provisions of Resolution 466/2012 of the National Health Council. The Ethics Research Committee of the Universidade Federal de Juiz de Fora approved the study (Approval nº 771/916).

RESULTS

A total of 400 questionnaires were analyzed, 315 of which were answered by the elderly person themselves and 85 by another respondent. A total of 64.5% of the sample was made up of women, the mean age was 73.8 (±8.02) and the educational level was 4.15 years (±3.40). A total of 45.5% declared themselves to be white, 59.0% belonged to socioeconomic level C, 55.8% were married or in a civil partnership, and 89.5% lived with a partner. Morbidity was verified in 89.0% of cases, difficulty walking was reported by 42.8% of the individuals, and 82.0% stated that they did not require help with locomotion.

The need to continuously take at least one medication was reported by 92.0% of the sample, while 40.6% had a caregiver (of whom 95.7% had family or friends as caregivers). A poor or fair perception of health was reported by 43.5% of the elderly. Depression and anxiety disorders were observed in 22.9% and 27.3% of the sample, respectively. In terms of geriatric syndromes, 35.7% of the elderly persons were frail, the majority (95.7%) had a fear of falling and 15.5% were functionally dependent.

The prevalence of falls was 35.3% (95% CI=30.7, 40.0). Of those who reported falls, 44.0% reported having fallen more than once. A total of 46.7% of falls occurred in the morning and more than half (62.9%) occurred at home. Among falls that occurred at home, 21.9% occurred in the bedroom. The elderly needed help getting up in 56.3% of cases of falls; there was no loss of consciousness in 88.3% of falls and in 27.5% of cases health care was sought due to trauma. Emergency care was the most used health service after the occurrence of a fall and public sector services were used in 68.2% of cases.

The results of the bivariate analysis of the associations between falls, age, gender, and demographic and socioeconomic variables are shown in Table 1.

Advanced age, lower socioeconomic level and a marital status of widowed were associated with the occurrence of the event. Falls were significantly associated with difficulty walking, need for human assistance with locomotion and having a caregiver (table 2).

Table 1. Falls among the elderly according to demographic and socioeconomic variables. Juiz de Fora, Minas Gerais, 2015.

Variable	Participants (n)	Falls (%)	Gross PR (CI 95%)	*p*
Gender				0.224
Male	142	61.8	1	
Female	258	38.2	1.34 (0.87;2.08)	
Age (Years)				< 0.001
60-70	157	27.4	1	
71-80	149	32.9	1.30 (0.80;2.12)	
Over 80	94	52.1	2.89 (1.70;4.93)	
Schooling				0.260
11 years or more	29	34.5	1	
8 to 10 years	27	22.2	0.54 (0.17;1.78)	
5 to 7 years	47	34.0	0.98 (0.37;2.60)	
1 to 4 years	248	35.9	1.06 (0.47;2.39)	
Illiterate	49	40.8	1.31 (0.51;3.40)	

to be continued

Continuation of Table 1

Variable	Participants (n)	Falls (%)	Gross PR (CI 95%)	*p*
Ethnicity/Skin colour				0.885
White	182	36.8	1	
Black	57	36.8	1.00 (0.54;1.86)	
Brown	132	31.8	0.80 (0.50;1.29)	
Yellow	20	40.0	1.14 (0.45;2.94)	
Indigenous	9	33.3	0.86 (0.21;3.54)	
Socioeconomic level				0.031
A or B	117	29.1	1	
C	236	36.0	1.37 (0.85;2.22)	
D or E	47	46.8	2.15 (1.07;4.32)	
Marital status				0.029
Married/ civil partnership	223	28.3	1	
Widowed	133	45.9	2.15 (1.37;3.37)	
Separated or divorced	30	43.3	1.94 (0.89;4.23)	
Single	14	28.6	1.02 (0.31;3.36)	
Household arrangement				0.917
Lives alone	42	33.3	1	
Lives with other person	358	35.5	0.91 (0.46;1.79)	

Table 2. Falls among elderly persons in relation to variables related to health profile. Juiz de Fora, Minas Gerais, 2015.

Variable	Participants (n)	Fall (%)	Gross PR (CI 95%)	*p*
Reported morbidity				0.501
No	44	29.5	1	
Yes	356	36.0	1.34 (0.68;2.65)	
Difficulty walking				0.001
No	229	28.4	1	
Yes	171	44.4	2.02 (1.33;3.06)	
Need for help with locomotion				0.037
No	328	32.3	1	
Human help	30	56.7	2.74 (1.28;5.85)	
Assistance Aid	42	42.9	1.57 (0.82;3.02)	
Continuous use of medication				0.387
None	32	25.0	1	
1 to 4 medications	203	36.0	1.69 (0.72;3.94)	
More than 4 medications	165	36.4	1.71 (0.73;4.05)	
Presence of caregiver				0.015
No	238	30.3	1	
Yes	162	42.6	1.71 (1.13;2.59)	
Perception of health[a]				0.093
Excellent / Very good / Good	178	30.3	1	
Fair / Poor	137	39.4	1.49 (0.94;2.39)	
Anxiety disorders[a]				0.997
No	229	34.1	1	
Yes	86	34.9	1.04 (0.62;1.75)	
Depression disorders[a]				0.929
No	243	34.2	1	
Yes	72	34.7	1.03 (0.59;1.78)	

[a] Variables investigated only when the elderly person themselves responded.

Significant gross prevalence ratios were observed for the presence of frailty and partial dependence in performing IADL (Table 3).

The results of the multivariate analysis of the factors associated with the occurrence of falls are shown in table 4.

Table 3. Falls among the elderly according to geriatric syndromes. Juiz de Fora, Minas Gerais, 2015.

Variable	Participants (n)	Falls (%)	Gross PR (CI 95%)	*p*
Frailty Syndrome[a]				0.002
No	222	29.7	1	
Yes	117	47.0	2.10 (1.32;3.33)	
Fear of falling[b]				0.524
No	15	26.7	1	
Yes	300	34.7	1.46 (0.45;4.70)	
Functional capacity for the performance of IADL				0.032
Independent	338	32.5	1	
Partial dependency	53	52.8	2.32 (1.29;4.17)	
Significant dependency	338	32.5	1.04 (0.25;4.22)	

[a] Variable investigated in accordance with Edmonton Frail Scale.

[b] Variables investigated only when the elderly persons themselves responded.

Table 4. Results of multivariate analysis of factors associated with falls among the elderly. Juiz de Fora, Minas Gerais, 2015.

Variable	Model 1[a] PR (CI95%)	p	Model 2[b] PR (CI95%)	P	Model 3[c] PR (CI95%)	p
Gender		0.575		0.222		0.509
Male	1		1		1	
Female	1.15 (0.70;1.89)		0.75 (0.48;1.19)		0.85 (0.52;1.38)	
Age (years)		0.003		0.003		0.007
60-70	1		1		1	
71-80	1.20 (0.70;2.00)		1.28 (0.78;2.08)		2.20 (1.21;4.03)	
Over 80	2.50 (1.37;4.55)		2.43 (1.37;4.35)		2.34 (1.26;4.35)	
Socioeconomic level		0.152				
A or B	1					
C	0.76 (0.46;1.26)					
D or E	0.59 (0.28;1.22)					
Marital status		0.084				
Married or civil partnership	1					
Widowed	0.64 (0.37;1.01)					
Separated or Divorced	0.49 (0.22;1.10)					
Single	0.83 (0.24;2.81)					
Difficulty walking				0.037		0.050
No			1		1	
Yes			1.67 (1.03;2.70)		1.69 (1.00;2.85)	
Need for help with locomotion				0.385		
No			1			
Human help			0.69 (0.30;1.60)			
Assistance Aid			1.07 (0.51;2.25)			

to be continued

Continuation of Table 3

Variable	Model 1[a] PR (CI95%)	p	Model 2[b] PR (CI95%)	P	Model 3[c] PR (CI95%)	p
Presence of caregiver				0.725		
No			1			
Yes			0.92 (0.56;1.49)			
Frailty Syndrome						0.407
No					1	
Yes					0.77 (0.42;1.42)	
Functional capacity for realization of IADL						0.476
Independent					1	
Partial dependence					0.89 (0.42;1.91)	
Significant dependence					1.77 (0.37;8.47)	

[a] Socioeconomic and demographic variables

[b] Socioeconomic and demographic variables plus health profile

[c] Socioeconomic and demographic variables, health profile plus geriatric syndromes

After all the adjustments (model 3), age and reported difficulty walking remained significantly associated with the outcome.

DISCUSSION

The prevalence of falls in the studied population was 35.3%, similar to that found in Brazilian literature[3-6,15,16]. Mota et al.[16], in a study with a sample of 1,064 elderly persons, found a prevalence of 30.3% for the outcome. In another study conducted in seven Brazilian states with elderly people aged 65 years or over, the prevalence of falls was 34.8%[5]. Soares et al.[17] estimated a prevalence of 37.5% among elderly people living in the community in the city of Cuiabá, Mato Grosso. Siqueira et al.[6] calculated a prevalence of falls of 27.6% in a cross-sectional study with a sample of 6,616 elderly people living in urban areas of 100 municipalities distributed across 23 Brazilian states. However, this study revealed a significant variation in the prevalence of falls between geographic regions, with the extremes in the southeast (30.0%) and the north (18.6%).

Different prevalences to those found in the present study have been reported in literature[7,9,18,19]. These differences can be attributed to the design of the studies, the characteristics of the sample, the methodologies adopted or because they are specific estimates with a margin of error. Pereira et al.[19] also adds that the significant differences in the prevalence of falls can be explained by the lack of a consensual definition for the event, which may lead to different interpretations by the elderly. The study by Pereira et al.[19], which was conducted in southern Brazil, asked whether the elderly person fell on the floor.

Among those who reported falling, 44.0% described having fallen more than once, indicating the recurrent nature of this event among the elderly[2,4,9,10,15,18,20]. This observation is important as it is based on the recognition that a history of falls is a risk factor for future falls[2,21] and that a greater number of falls increases the probability of a future event resulting in fracture[4,22]. Most of the falls occurred in the own home of the elderly persons and in the morning. According to data from the Ministry of Health[1] and other studies[7,9,10,20] a large proportion of accidental falls occur indoors or nearby during routine activities such as walking, changing position and going to the toilet. For Antes et al.[7] a greater number of falls occur in the morning as it is the time of day when the elderly person performs routine tasks, such as domestic activities.

Several studies corroborate the findings of the present study, namely that the occurrence of falls was associated with age[2,3,5,9,10,15-18,21,23] and difficulty walking[2,3,9,20,21,24,25]. These factors are closely related, as the aging process has repercussions on structural and functional disorders capable of modifying mobility patterns and the relation of the individual to the environment[26–28].

As the years pass, the importance of environmental factors in explaining the way in which elderly individuals perform their social relations and everyday interactions increases, as well as the different forms of illness and negative outcomes in health[19]. In the absence of an environment that optimizes their potential, the elderly end up limiting their activities, which within a cascade of events augments the disorders arising from the biological aging process.

With advancing age, there is reduction of muscle strength and elasticity, a decrease in bone mass, impairment of joint stability and dynamics, and sensory, vestibular and somatosensory and nervous system disorders. This set of modifications has an impact on the mechanisms of postural control, leading to disturbances in gait, balance and posture. This cascade of changes, besides making it difficult to carry out activities of daily living, predisposes the elderly to falls[2,21,24–28].

Elderly persons suffer a decline in the ability to detect and control the back and forth oscillation of the body and also an increase in oscillation, both with their eyes open and closed; a reduction in the perception of joint movement and proprioceptive loss. These factors have been identified as key elements for postural control in an upright position and for locomotion capacity[25,26,29]. The consequences of these changes, allied to others such as cognitive decline, reduced nerve conduction speed and declining strength and muscle tone, cause the elderly to acquire more conservative gait patterns[25,26,29].

This conservative gait pattern is characterized by a slower than usual gait speed, shorter pitch length and height, an increased support base and time spent in the double support phase; and increased cadence in situations where an increase in walking speed is required. These adaptations that occur with aging are considered a compensatory process that seeks to maximize stability and promote greater safety. In situations in which balance is disturbed, elderly individuals are less able to perform reactions that lead to the resumption of balance and avoid the occurrence of falls. They are less able to displace body weight and take quick steps or change their trajectory, have difficulty initiating reactions with the upper limbs and a reduced ability to reach and quickly grasp something that can support them and avoid falls. It is worth reporting that the described condition is even more pronounced in elderly persons with a history of falls[2,24,25,29].

In this analysis, it should be pointed out that the changes that occur within the aging process do not directly and necessarily result in disease, but the probability of its onset increases with age, due to vulnerability to pathological processes and difficulty in maintaining homeostasis[27,31]. Thus, aging is an agent that modifies and at the same time is modified by the presence of a certain health condition. Within this perspective, difficulty walking may be a consequence of the process of senescence or the synergistic action between this process and the main actions of this phase of life.

Although not explored in the present study, the results encourage a discussion about the importance of the practice of physical activity as an effective tool for coping with major geriatric syndromes. Literature shows that the practice of regular physical activity can minimize the deleterious effects of aging, contributes to the maintenance and/or improvement of muscular strength, body balance, coordination and speed of movement, cognitive ability and also functional ability[9,32,33]. It is therefore a powerful strategy for the prevention of falls in the elderly population[5,9,33].

The aging process and its main tangential aspects, such as falls, are the result of a complex interaction of several factors that reflect biological aspects and genetic heritage, but also the cumulative impact of these factors, linked to environmental and social issues, which translate into inequalities and inequities in health. This complex network of interactions heightens the need for interdisciplinary and cross-domain interventions and approaches. Age and walking difficulty were factors associated with falls in the present study.

Although age is considered a non-modifiable risk factor, two reflections should arise on this result: it is possible to promote healthy aging for future generations in a planned manner, while it is essential to develop actions that reduce negative impacts of aging and optimize quality of life for those already in this phase of life. Due to the cross-sectional design of this research, it is not possible to make inferences about the causality of the association in relation to the difficulty in walking reported by the elderly. However, it is worth reporting that, regardless of causality,

walking difficulty can be considered a modifiable risk factor, which requires action involving the individual and the environment. These actions should occur both individually and collectively, in order to reduce barriers and circumstances that make locomotion even more challenging for the elderly and increase the risk of falls.

It should be emphasized that the present study was conducted with high levels of methodological rigor; that the necessary precautions in the sampling process were considered; and that similar results in literature were provided. Considering the use of sample weighting, there would be little variation in the estimated parameters even if the sample were expanded.

CONCLUSION

Falls are frequent events among the elderly and have been associated with increasing age and reporting difficulty walking. The identification of these factors allows the recognition of the groups that are most susceptible to the occurrence of this outcome and consequently offers important support for the elaboration and planning of government policies, actions and strategies to address this serious public health problem. Faced with an aging population and the new demands emerging from this phenomenon, it is imperative to overcome the paradigms that affect the elderly and to adopt a more equanimous and attentive vision of the health of these individuals.

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Notification of cases of HIV/AIDS among the elderly in the state of Ceará: the historical sequence between 2005 and 2014

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Abstract

Objective: to describe the historical sequence and characteristics of reported cases of HIV/AIDS among the elderly in the state of Ceará from 2005 to 2014. *Method:* a descriptive study was carried out, based on the Ministry of Health database, available in SINAN (Disease Cases Notification Information System) from January 2005 to December 2014. The variables studied were: gender, race, schooling, marital status and exposure category. *Result:* a total of 10,299 new cases were reported in the state, 1.5% (151) of which related to the elderly. The majority of those affected lived in Fortaleza (85.6%), were aged between 60 and 69 years (86.8%), were male (60.9%), brown (61.6%), had a level of schooling below unfinished elementary (42%), were heterosexual (85.4%) and had a marital status of married (29.3%). The proportion of male/female cases peaked in 2005 (5.5: 1) and declined thereafter reaching an average value of 0.8: 1 in the period between 2008 and 2011, then increased again, reaching 3.3: 1 in 2014. The highest coefficients were observed in the groups with lower schooling. *Conclusion*: according to the notifications during the period evaluated, AIDS among the elderly showed a tendency of growth among men, aged between 60 and 69 years old, who were heterosexual, less educated and married. This justifies the strengthening of specific strategies aimed at this population with the objective of tackling the disease.

Keywords: Disease Notification. Health of the Elderly. Acquired Immunodeficency Syndrome. Sexuality.

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INTRODUCTION

The exercise of sexuality is one of the facets used to evaluate the "social relations" domain of the instrument used by the World Health Organization (WHO) for the evaluation of quality of life[1]. In the context of aging it is a factor of significant importance for the quality of life of the elderly[2-5].

Aging does not diminish interest in sex, which can be experienced in different ways [4,5], and it is possible to continue the exercise of sexuality throughout human life, especially in old age[6]. Despite this, the theme of sexuality is not always treated openly, especially in relation to old age, as it refers to intimate experiences, and it is even treated with prejudice in some cases[5,7].

The technology involved in the development of new drugs has reduced the discomfort caused by advancing age in the area of sex, allowing the consequences and limitations resulting from the natural process of human aging to be reversed[8]. Studies in this area[9,10] have identified an increase in the number of cases of sexually transmitted infections in this age group.

Among the factors cited to explain the increase in the number of HIV/AIDS cases among the elderly population are the increase in the use of medications to control sexual impotence, prejudice in relation to sexuality in old age[11], the shortage of health strategies that inform the elderly about the prevention of sexually transmitted infections and the lack of knowledge of pathology of this population segment[12,13].

In response to the increased incidence of HIV among the elderly, in 2008 and 2009 the National STD and AIDS Program carried out campaigns that sought to emphasize the importance of using condoms in sexual relations. The WHO recognizes Brazil as one of the pioneers in initiating such campaigns due to the increased incidence of the disease[13]. More recently, the Department of Surveillance, Prevention and Control of Sexually Transmissible Infections (STI), HIV/AIDS and viral hepatitis of the Ministry of Health has centralized decision-making and strategy planning in this area.

However, while the interventions of the Brazilian government in relation to HIV/AIDS and strategies focusing on information about and prevention of the disease aimed at the elderly still occur, they are not continuous[2]. This is most likely because of the social conception that "old age is asexual," which means health professionals who care for the elderly generally fail to consider the possibility of HIV infection, and as a consequence, do not provide information about sexually transmitted infections, communicable diseases and AIDS. Despite this restricted view, both in terms of sexuality and old age, unprotected sexual exposure is today the main form of HIV infection among the elderly[10].

When the sexuality of the elderly is denied socially, they end up at a disadvantage in relation to preventive campaigns on HIV/AIDS. As a result, the information provided is insufficient to ensure the prevention of the disease, contributing to increasing vulnerability[14].

The first case of AIDS among the elderly in the northeast of Brazil occurred in the state of Ceará in 1983, although the patient came from the southeast of the country[14]. In 2004 5,763 new cases were registered in the state, of which 116 affected the elderly[15]. In 2012, around 800 AIDS cases were reported, of which 53.7% were related to people living in the state capital. With regard to the internal distribution of HIV/AIDS, 96% of all municipal regions in Ceará have identified at least one case of AIDS[16].

The present study aims to describe the time series and characteristics of the reported cases of HIV/AIDS among the elderly in the state of Ceará between 2005 and 2014.

METHOD

This descriptive epidemiological study was carried out based on an analysis of secondary data from the Disease Cases Notification Information System (SINAN) of the state of Ceará, made available by the Department of Informatics of the Unified Health System (DATASUS), from January 2005 to December 2014. For data collection, the reported cases of HIV/AIDS involving individuals aged 60 considered the following variables:

a) Individual characteristics of subject:

- Gender: male or female;
- Race: white, black, brown, yellow or not informed;
- Age: categorized into: 60 to 69 years, 70 to 79 years and over 80 years.

b) Social characteristics of subjects

- Schooling: illiterate, 1st to 4th grade incomplete, 1st to 4th grade complete, 5th to 8th grade incomplete, complete elementary education, incomplete secondary education, complete secondary education, incomplete higher education, complete higher education, not informed.
- Marital status: single, married, legally separated, widowed, other, not informed.
- Category of exposure: heterossexual, homossexual and bissexual.

A descriptive analysis of the data was performed and the Fisher's Exact test was used to verify the association between the analyzed variables and age group, considering a level of significance of 5%. The analyzes were performed in the SAS program (Institute Inc., Cary, NC, USA, Release 9.2, 2010).

RESULTS

During the study period, 151 (1.47%) of the 10,299 new HIV/AIDS cases reported in the state involved individuals aged 60 years or older. Table 1 shows the variation in the number of cases reported in relation to the year analyzed. The number of cases per 100,000 inhabitants more than doubled in the period evaluated for the overall population and oscillated among the elderly, varying from 0.13 cases/100,000 inhabitants in 2011 to 0.28 cases/100,000 inhabitants in 2012.

Figure 1 shows the HIV/AIDS trend lines, considering the overall and the elderly population in the state of Ceará, during the evaluation period. An increasing trend in cases was noted in the period among both the overall and the elderly population.

Table 1. Distribution of frequencies of reported cases of HIV/AIDS in Ceará, from 2005 to 2014, in relation to the overall population.

Year of Notification	Population of State	Population with HIV[1]		Elderly persons with HIV[2]	
		N	Cases/100,000 inhab..[3]	n(%)	Cases/100,000 inhab.
2005	8,097,276	463	5.72	13 (2.81)	0.16
2006	8,217,140	724	8.81	14 (1.93)	0.17
2007	8,335,849	816	9.79	13 (1.59)	0.16
2008	8,450,527	753	8.91	19 (2.52)	0.22
2009	8,547,750	1233	14.42	13 (1.05)	0.15
2010	8,452,381	1548	18.31	13 (0.84)	0.15
2011	8,530,155	1414	16.58	11 (0.78)	0.13
2012	8,606,005	1228	14.27	24 (1.95)	0.28
2013	8,840,000	1071	12.12	18 (1.68)	0.20
2014	8,904,459	1049	11.78	13 (1.24)	0.15
Period	8,498,154	10299	121.19	151 (1.47)	1.78

[1]Frequency in relation to overall population; [2] Frequency in relation to people with HIV; [3]Inhabitants.

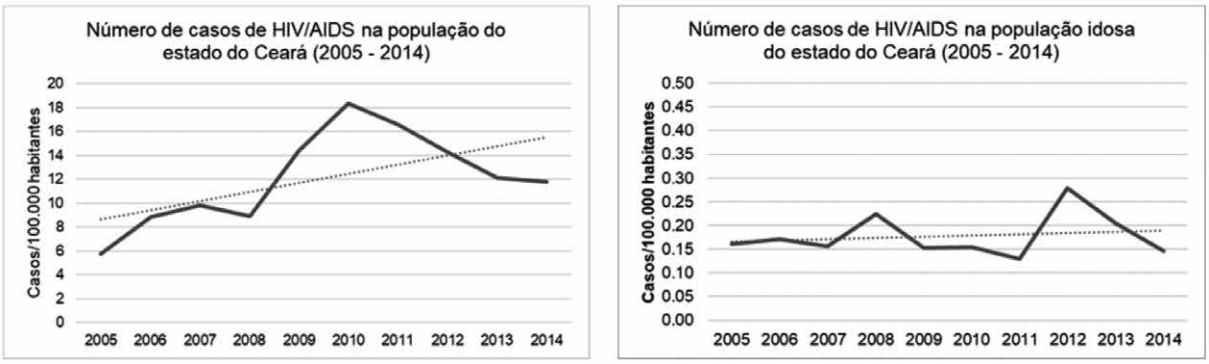

Figure 1. Trends in notifications of cases of HIV/AIDS in the overall population and among elderly people in the state. Ceará, Brazil, 2005 – 2014.

Table 2 shows the frequency distribution of the reported cases according to sociodemographic variables. The number of reports was higher among individuals aged between 60 and 69 years (86.8%), men (60.9%), those with brown skin colour/race (61.6%) a predominantly lower educational level (42%) and heterosexual (85%).

Considering the age classes tested, no association was found between the frequency of HIV/AIDS cases, gender, race and level of education (p>0.05). Regarding marital status and type of exposure, it was noted that among those aged 60 to 69 years, there was a predominance of elderly people who declared themselves to be married and heterosexual, while for the other age groups, those declaring themselves to be unmarried, homosexual and bisexual predominated. For the marital status and schooling variables, most of the notifications provided incomplete information, which were considered as not informed.

Table 2. Distribution of frequencies of notified cases of HIV/AIDS among the elderly in Ceará, by age range, from 2005 to 2014, in function of sociodemographic variables.

Variable	Age range			Total	*p*-value*
	60 to 69 years	70 to 79 years	>79 years		
	n($%)	n($%)	n($%)	n(#%)	
Gender					
Male	78 (84.8)	11 (12.0)	3 (3.3)	92 (60.9)	0.5829
Female	53 (89.8)	4 (6.8)	2 (3.4)	59 (39.1)	
M/F ratio	1.5:1	2.7:1	1.5:1	1.6:1	
Race					
White	13 (81.2)	2 (12.5)	1 (6.3)	16 (10.6)	0.5277
Non-white	117 (87.5)	13 (9.7)	4 (3.0)	134 (88.7)	
Not informed	1 (100.0)	0 (0.0)	0 (0.0)	1 (0.7)	
Marital status					
Married	29 (93.5)	1 (3.2)	1 (3.2)	31 (20.5)	0.0285
Not married	32 (71.1)	10 (22.2)	3 (6.7)	45 (29.8)	
Not informed	70 (93.3)	4 (5.3)	1 (1.3)	75 (49.7)	
Degree of exposure					
Homosexual/Bisexual	14 (63.6)	5 (22.7)	3 (13.6)	22 (14.6)	0.0025
Heterosexual	117 (90.7)	10 (7.8)	2 (1.6)	129 (85.4)	
Not informed	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	
Schooling					
Illiterate	15 (88.2)	1 (5.9)	1 (5.9)	17 (11.2)	0.7644
Up to complete elementary	42 (85.7)	6 (12.2)	1 (2.0)	49 (32.4)	
Over complete elementary	15 (93.8)	1 (6.2)	0 (0.0)	16 (10.6)	
Uninformed	59 (85.5)	7 (10.1)	3 (4.3)	69 (45.7)	
Total	131 (86.8)	15 (9.9)	5 (3.3)	151 (100.0)	

$ Percentage on line within each variable; # Percentage in column within each variable. For statistical analysis the uninformed cases were withdrawn; * Fisher's Exact Test.

Table 3 shows the variables analyzed based on year of notification and gender, race, education level and marital status. In general, there was a greater number of cases among men, with the exception of the years 2008, 2010 and 2011. There was a downward trend in the male/female ratio of new cases of HIV/AIDS until 2011, but this increased again afterwards, climbing as high as 3.3 diagnosed men for every one diagnosed woman (3.3:1).

Table 4 shows that, in relation to category of exposure, the majority (76.1%) of the men notified were in the heterosexual category, followed by the homosexual category (15.2%). Among women, all cases occurred by heterosexual transmission. There was no significant association ($p<0.001$) between Category of Exposure and gender.

Table 3. Distribution of frequencies of reported cases of HIV/AIDS among the elderly in Ceará, according to sociodemographic variables, per year of study.

Variable		Year of incidence									
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
		n(%)	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)
Gender	Male	11 (84.6)	9 (64.3)	8 (61.5)	7 (36.8)	8 (61.5)	4 (30.8)	5 (45.5)	17 (70.8)	13 (72.2)	10 (76.9)
	Female	2 (15.4)	5 (35.7)	5 (38.5)	12 (63.2)	5 (38.5)	9 (69.2)	6 (54.5)	7 (29.2)	5 (27.8)	3 (23.1)
M/F Ratio		5.5:1	1.8:1	1.6:1	0.6:1	1.6:1	0.4:1	0.8:1	2.4:1	2.6:1	3.3:1
Race	White	2 (15.4)	2 (14.3)	0 (0.00)	2 (10.5)	2 (15.4)	1 (7.7)	0 (0.00)	2 (8.3)	2 (11.1)	3 (23.1)
	Black	1 (7.7)	3 (21.4)	0 (0.00)	3 (15.8)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (7.7)
	Brown	7 (53.8)	7 (50.0)	11 (84.6)	0 (0.00)	0 (0.00)	12 (92.3)	11 (100.0)	21 (87.5)	15 (83.3)	9 (69.2)
	Yellow	0 (0.00)	0 (0.00)	0 (0.00)	1 (5.3)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
	Not-informed	3 (23.1)	2 (14.3)	2 (15.4)	13 (68.4)	11 (84.6)	0 (0.00)	0 (0.00)	0 (0.00)	1 (5.6)	0 (0.00)
Degree of schooling	Illiterate	2 (15.4)	3 (21.4)	1 (7.7)	3 (15.8)	0 (0.00)	0 (0.00)	0 (0.00)	4 (16.7)	4 (22.2)	3 (23.1)
	1st to 4th grade incompleta	2 (15.4)	1 (7.1)	3 (23.1)	4 (21.1)	2 (15.4)	4 (30.8)	0 (0.00)	2 (8.3)	1 (5.6)	0 (0.00)
	Complete 4th grade	0 (0.00)	0 (0.00)	1 (7.7)	2 (10.5)	1 (7.7)	0 (0.00)	2 (18.2)	0 (0.00)	0 (0.00)	0 (0.00)
	Incomplete 5th to 8th	2 (15.4)	5 (35.7)	2 (15.4)	0 (0.00)	1 (7.7)	2 (15.4)	0 (0.00)	1 (4.2)	3 (16.7)	1 (7.7)
	Elementary complete	2 (15.4)	0 (0.00)	1 (7.7)	2 (10.5)	0 (0.00)	0 (0.00)	0 (0.00)	1 (4.2)	1 (5.6)	1 (7.7)
	Incomplete high school	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (4.2)	0 (0.00)	1 (7.7)
	Complete high school	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (7.7)	2 (15.4)	0 (0.00)	0 (0.00)	0 (0.00)	1 (7.7)
	Complete higher	2 (15.4)	2 (14.3)	0 (0.00)	1 (5.3)	1 (7.7)	1 (7.7)	1 (9.1)	1 (4.2)	1 (5.6)	0 (0.00)
	Not informed	3 (23.1)	3 (21.4)	5 (38.5)	7 (36.8)	7 (53.8)	4 (30.8)	8 (72.7)	14 (58.3)	8 (44.4)	6 (46.1)
Marital status	Single	1 (7.7)	4 (28.6)	2 (15.4)	3 (15.8)	0 (0.00)	2 (15.4)	3 (27.3)	5 (20.8)	-	-
	Married	4 (30.8)	1 (7.1)	7 (53.9)	5 (26.3)	0 (0.00)	4 (30.8)	6 (54.6)	4 (16.7)	-	-
	Separated	1 (7.7)	0 (0.00)	1 (7.7)	2 (10.5)	0 (0.00)	2 (15.4)	1 (9.1)	2 (8.3)	-	-
	Widowed	0 (0.00)	3 (21.4)	1 (7.7)	4 (21.1)	0 (0.00)	2 (15.4)	1 (9.1)	3 (12.5)	-	-
	Other	1 (7.7)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (4.2)	-	-
	Not informed	6 (46.1)	6 (42.9)	2 (15.4)	5 (26.3)	13 (100.0)	3 (23.1)	0 (0.00)	9 (37.5)	-	-
Total		13 (100.0)	14 (100.0)	13 (100.0)	19 (100.0)	13 (100.0)	13 (100.0)	11 (100.0)	24 (100.0)	18 (100.0)	13 (100.0)

* Marital status data not available for the years 2013 and 2014.

Table 4. Distribution of the number of HIV/AIDS cases among the elderly, according to the Category of Exposure, year of notification and gender.

Year	Category	Male	Female	Total
		N (#%)	N (#%)	N (#%)
2005	Heterosexual	11 (100.0)	2 (100.0)	13 (100.0)
	Total partial	11 (100.0)	2 (100.0)	13 (100.0)
2006	Homosexual	1 (11.1)	0 (0.0)	1 (7.1)
	Bisexual	1 (11.1)	0 (0.0)	1 (7.1)
	Heterosexual	7 (77.8)	5 (100.0)	12 (85.2)
	Total partial	9 (100.0)	5 (100.0)	14 (100.0)
2007	Homosexual	3 (37.5)	0 (0.0)	3 (23.1)
	Bisexual	1 (12.5)	0 (0.0)	1 (7.7)
	Heterosexual	4 (50.0)	5 (100.0)	9 (69.2)
	Total partial	8 (100.0)	5 (100.0)	13 (100.0)
2008	Homosexual	1 (14.3)	0 (0.0)	1 (5.3)
	Bisexual	1 (14.3)	0 (0.0)	1 (5.3)
	Heterosexual	5 (71.4)	12 (100.0)	17 (89.5)
	Total partial	7 (100.0)	12 (100.0)	19 (100.0)
2009	Homosexual	1 (12.5)	0 (0.0)	1 (7.7)
	Bisexual	1 (12.5)	0 (0.0)	1 (7.7)
	Heterosexual	6 (75.0)	5 (100.0)	11 (84.6)
	Total partial	8 (100.0)	5 (100.0)	13 (100.0)
2010	Homosexual	1 (25.0)	0 (0.0)	1 (7.7)
	Bisexual	1 (25.0)	0 (0.0)	1 (7.7)
	Heterosexual	2 (50.0)	9 (100.0)	11 (84.6)
	Total partial	4 (100.0)	9 (100.0)	13 (100.0)
2011	Heterosexual	5 (100.0)	6 (100.0)	11 (100.0)
	Total partial	5 (100.0)	6 (100.0)	11 (100.0)
2012	Homosexual	3 (17.7)	0 (0.0)	3 (12.5)
	Bisexual	1 (5.9)	0 (0.0)	1 (4.2)
	Heterosexual	13 (76.5)	7 (100.0)	20 (83.3)
	Total partial	17 (100.0)	7 (100.0)	24 (100.0)
2013	Homosexual	4 (30.8)	0 (0.0)	4 (22.2)
	Bisexual	1 (7.7)	0 (0.0)	1 (5.6)
	Heterosexual	8 (61.6)	5 (100.0)	13 (72.2)
	Total partial	13 (100.0)	5 (100.0)	18 (100.0)
2014	Bisexual	1 (10.0)	0 (0.0)	1 (7.7)
	Heterosexual	9 (90.0)	3 (100.0)	12 (92.3)
	Total partial	10 (100.0)	3 (100.0)	13 (100.0)
2005 a 2014**	Homosexual	14 (15.2)	0 (0.0)	14 (9.3)
	Bisexual	8 (8.7)	0 (0.0)	8 (5.3)
	Heterosexual	70 (76.1)	59 (100.0)	129 (85.4)
	Overall total	92 (100.0)	59 (100.0)	151 (100.0)

Percentage in column within each year.

DISCUSSION

Data from the present study showed that the number of reports of HIV/AIDS in the state of Ceará demonstrated an increasing trend between 2005 and 2014, both among the overall population and among the elderly. This trend was also observed in Brazil between 2006 and 2015, where there was an increase in the number of cases, especially in the northeast and north[17]. Although the HIV/AIDS epidemic has existed in the state of Ceará for more than 30 years, almost 50% of cases were reported between 2007 and 2014[18].

A greater number of cases was reported in the state among males aged between 60 and 69 years, characterizing them as the predominant segment and probably the "diffusing hub" of the epidemic[11,19]. It should be noted that although there was a reduction in the proportion of men in notified cases in the years 2006 to 2011, this figure increased again from 2012 to 2014.

The behavior of the ratio between the genders in this period, influenced by such fluctuations, is related to the fact that heterosexual was the most frequent category of transmission, a fact also observed in previous studies[3,6].

There was an increasing trend in the proportion of notifications involving individuals with lower levels of schooling, as a lack of education increases the possibility of HIV/AIDS infection, with lower levels of schooling resulting in less effective prevention of the disease[9,20]. This finding may be closely related to greater access to information among individuals with higher levels of education[21]. Furthermore, lower levels of education are related to less knowledge about the forms of HIV/AIDS transmission[22,23] which may be closely related to greater access to information among more educated individuals[21,24]. Lower levels of education, meanwhile, result in less knowledge about the forms of HIV/AIDS transmission[23]. In the northeast, illiteracy among the elderly is alarming, exceeding 40% in Ceará[25]. This demonstrates the importance of prevention strategies and educational campaigns, which should be clear and adapted to the level of understanding of individuals with less formal education. In contrast, it should be remembered that low educational levels can contribute to a poor understanding of the disease, even if the individual receives the correct information from reliable sources[26].

In terms of age group, it can be inferred that part of the studied population must have become infected before the age of 60, as it can take 5 to 10 years for notification to become effective[27].

Regarding gender, several authors, in agreement with the findings of the present study, have found that men are the most affected, regardless of age[11,13,20,21,28], although a process of feminization is occurring[15,27,29]. In the study period, it was observed that in three years (2008, 2010 and 2011) the number of notifications was higher among women.

Since Law nº 9.313/96 was passed in 1996, individuals with HIV/AIDS have benefited from free and universal access to antiretrovirals, which has increased the chance of survival, even among age groups not previously covered by such care[15]. In addition, the notification of cases, the provision of prophylactic measures to prevent the vertical transmission of the virus[30], the diagnostic support of Test and Counselling Centers (CTA) and a surveillance policy with studies of specific population groups involving strategies aimed at reducing harm to health through the misuse of injecting drugs and free supply of condoms have all become compulsory[26].

There is a need for more campaigns aimed at the elderly in order to raise awareness of the need to use condoms, as while the evolution of pharmacology and medicine has provided this group with a longer active sexual life, cultural factors have increased the risk of acquiring HIV/AIDS and other diseases[14]. The use of condoms among the elderly is low, either due to a lack of understanding about their importance in the postmenopausal period, or due to the difficulty of negotiation between partners with regard to adopting safer sexual practices, in addition to reduced knowledge about the transmission routes of HIV, low perception of the risk of HIV infection motivated by the woman's trust in a stable relationship, and the possibility that requesting to use condoms can generate suspicions of infidelity. This phenomenon was identified in the present research, given the large number of married elderly persons among the cases reported, which is in accordance with data from literature[4,6,15,21,24,27].

In Brazil, great progress has already been made in relation to health and social care, especially with regard to the legalization of the rights of the elderly[7]. However, health actions aimed at older people tend to focus on HIV/AIDS, and are diluted amongst care for other age groups. For these campaigns to be more widespread, it is necessary to involve various institutional sectors and civil society, such as social centers and churches, in conjunction with health and social care professionals, in order to reduce the stigma surrounding the sexual needs of the elderly, so that they can discuss topics related to their sexuality more easily.

It is understood that more studies on this little explored topic are required, as they can contribute to more effective interventions, through the dissemination of information to the elderly, health professionals and family members.

The present study is limited in the depth of its investigation of the question of sexuality and drug use, due to the lack of this information in the researched database, and in the large number of overlooked variables, indicating the fragility of the data produced in the information system, directly reflecting the quality of the information produced. It does, however, demonstrate the importance of a deeper discussion on the vulnerability of the elderly to HIV/AIDS, looking beyond the priority groups of adults, children and adolescents.

To achieve a holistic approach to HIV/AIDS in this population, there is a need to understand the biological and cultural processes involved in sexuality and autonomous and healthy aging, which go beyond the idea of a dependent elderly person who is sick and awaiting death. Sexuality among the elderly has to be treated and stimulated within a healthy practice and without stigmas, so that it becomes another factor that contributes to an autonomous and full life for this population.

CONCLUSION

The reports of cases of HIV/AIDS among the elderly demonstrated a slightly increasing trend in the period evaluated. It was found that the number of notifications was greater among men, aged 60 to 69 years, who were heterosexual, had low levels of schooling and were married. The identification of this profile and trend can contribute to the planning of health actions related to HIV/AIDS, with the emphasis on the use of condoms by elderly people, while a multisectoral effort is needed to reduce the stigma that involves the sexual needs of this age group. The need for further studies in this area is also emphasized, as these can contribute to more effective interventions by disseminating information among the elderly, health professionals and family members, thus improving geriatric and gerontological practice.

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Leprosy in the elderly population of Alagoas

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Abstract

Objective: to describe the epidemiological profile of elderly persons with leprosy in the state of Alagoas. *Method:* a descriptive epidemiological study of leprosy cases among the elderly reported to the Disease Notification Information System between 2005 and 2015 was carried out. *Results:* a total of 896 cases were identified, with a predominance of 60-69 years old (60.5%), who were male (50.4%), had no schooling (34.8%), no source of income (54.1%), multibacillary forms of the disease (67.9%), and a high proportion of grade I (30.3%) and II (11.8%) disability at diagnosis. Hyperendemicity was noted during the survey period, with a mean detection rate of 29.48 cases per 100,000 inhabitants. *Conclusion:* leprosy is a growing disease among the elderly and early detection should be encouraged in this population to prevent the impairment of active aging.

Keywords: Leprosy. Epidemiology Descriptive. Elderly.

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INTRODUCTION

The process of population aging is a global reality that brings with it biopsychosocial challenges, as the demographic increase of elderly people influences the organization of the health services and requires a rethink of public policies in order to confer equality and access of health care to these populations[1, 2].

It is estimated that in 2025 Brazil will have the world's sixth oldest population[3]. Long-lived persons often suffer functional loss, which can be accelerated by certain diseases, such as leprosy[2].

This is a chronic infectious contagious disease that, if not diagnosed, may evolve into the tuberculoid, dimorphic or Virchowian forms. Late diagnosis is related to neural impairment with physical disability, since the course and manifestations of the disease depend on the response of the immune system to the bacillus and symptoms may take up to 20 years to appear[4,5].

An analysis of all leprosy cases reported from 2012 to 2016 in Brazil revealed that the mean detection rate was approximately eight times higher in the male population aged 60 years and over than in those aged under 15[6].

In this context, it is known that leprosy has a greater impact on the elderly, as Hansen's bacillus features incapacitating vectors, resulting in an impairment of the dynamics of the life of the individual, especially in those where functional capacity is already affected by the natural course of the health-disease process, in addition to affecting personal relationships and the support network[7].

The study of leprosy in the elderly is therefore pertinent, as this group tends to experience more complex profiles of the disease and it is important to increase our knowledge of the profile of the population of elderly people affected by leprosy. The aim of the present study was therefore to describe the epidemiological profile of elderly people with leprosy in the state of Alagoas.

METHOD

A descriptive epidemiological study of leprosy cases reported in elderly people in Alagoas from 2005 to 2015 was carried out. The data were extracted from the Disease Notification Information System (SINAN) together with the Alagoas State Health Department.

After the data were collected, the information was classified and tabulated according to the research objectives and analyzed descriptively.

Simple descriptive analyzes were performed with the aim of characterizing the study population. The study consisted of sociodemographic (age, gender, race, level of schooling and occupation) and clinical variables (clinical form, operational classification, smear microscopy results, physical disability grade at diagnosis and discharge, number of skin lesions and detection rate). As the study used secondary data it was not submitted to the Ethics Research Committee.

RESULTS

A total of 896 cases of leprosy were reported in elderly persons between 2005 and 2015, 60.5% of whom were in the 60-69 age group and 50.5% of whom were male.

Regarding the clinical form of the disease, the Dimorphous (271 - 30.2%); multibacillary (608 - 67.9%) form with more than five dermatological lesions (386 - 43.0%) was prevalent.

In terms of operational classification, a prevalence of multibacillary cases of over ten years was observed.

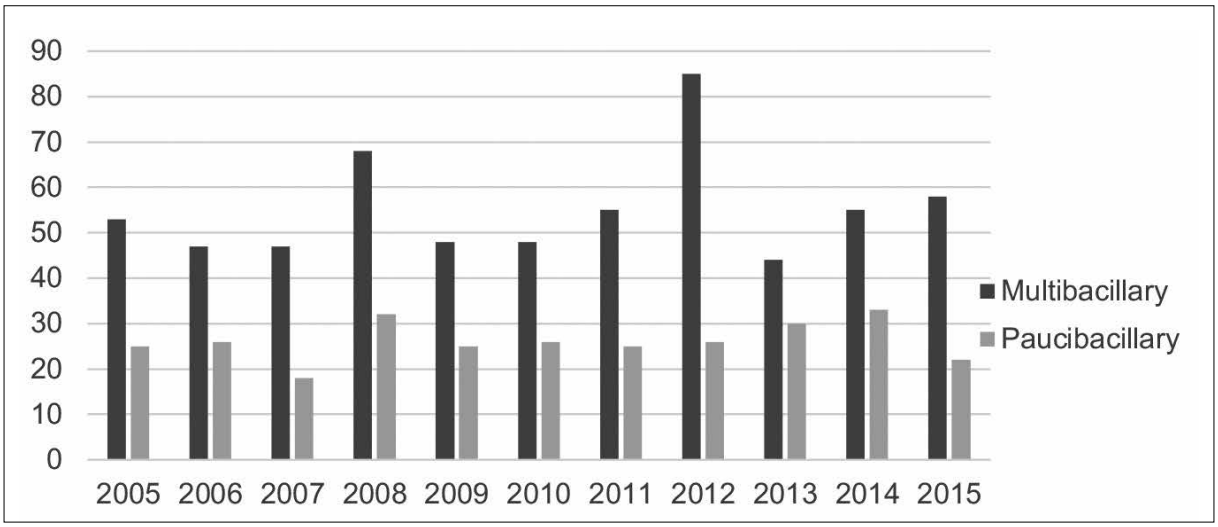
Regarding the evaluation of physical disabilities caused by leprosy in the diagnosis, grade 0 disability was prevalent (370-41.3%). However, a considerable percentage (277 - 42.1%) had grade I or II disability. The categories 'not evaluated' and 'ignored' are noteworthy as they represent 149 cases (16.6%). In terms of the assessment of grade of physical disability at discharge, the data show that grade 0 was predominant (280 - 31.2%), but the 'not evaluated' and 'ignored' variables represented approximately half the cases (398 - 44.4%).

Table 1. Sociodemographic characteristics of elderly persons with leprosy (N= 896).

Variable	n (%)
Age (years)	
60 – 69	542 (60.5)
70-79	278(31.0)
80 or more	76(8.5)
Gender	
Female	444 (49.5)
Male	452 (50.5)
Ethnicity/Skin color	
White	203 (22.7)
Brown	542 (60.5)
Black	106 (11.8)
Others and not informed	45(5.0)
Schooling (years)	
None	312 (34.8)
1 to 3	215 (24.0)
4 to 7	106 (11.8)
8 to 11	52(5.8)
12 or more	20 (2.2)
Not informed or non-applicable	191(21.4)
Occupation	
Retired	212 (23.7)
No source of income	485 (54.1)
Other professions	199 (22.2)

Table 2. Clinical characteristics of elderly persons diagnosed with leprosy (N=896).

Variable	n (%)
Clinical form	
Indeterminate	80 (8.9)
Tuberculoid	178 (19.9)
Dimorphous	271 (30.2)
Virchowian	176 (19.6)
Unclassified	129 (14.4)
Ignored	62(7.0)
Operational Classification	
Paucibacillary	288 (32.1)
Multibacillary	608 (67.9)
Number of Dermatological Lesions	
Zero	63 (7.1)
Single lesion	170 (19.0)
2 to 5	277 (30.9)
More than 5	386 (43.0)
Smear microscopy	
Ignored	371 (41.4)
Positive	83 (9.3)
Negative	107 (11.9)
Not performed	335 (37.4)

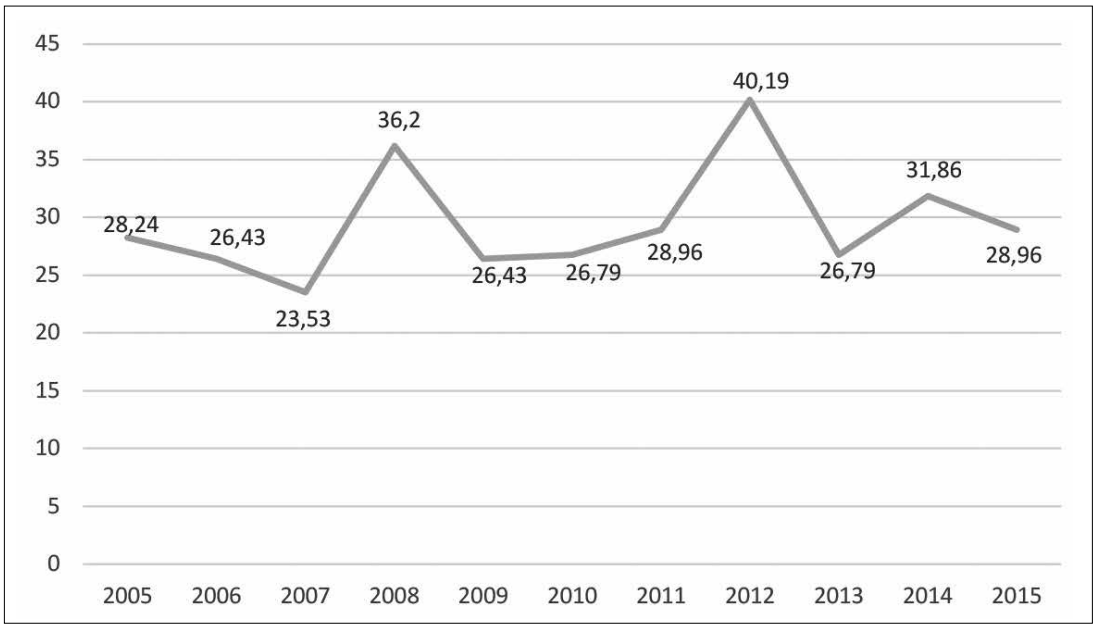


Graph 1. Proportion of cases of leprosy in elderly persons according to operational classification (N=896).

Table 3. Physical disability (PD) grade in elderly persons with leprosy (N=896).

Variable	n (%)
Physical disability grade at diagnosis	
Zero	370(41.3)
Grade I	271 (30.3)
Grade II	106(11.8)
Not evaluated	97(10.8)
Ignored	52(5.8)
Grade of physical disability at diagnosis	
Zero	280(31.2)
Grade I	151(16.9)
Grade II	67(7.5)
Not evaluated	134(14.9)
Ignored	264(29.5)

A detection rate of over 20 cases per 100,000 inhabitants was observed, with a mean of 29.48 cases between 2005 and 2015. This data reflects a hyperendemic epidemiological situation in the state, according to the parameters of the Ministry of Health[8]. High rates in 2008 and 2012 (36.20 and 40.19, respectively) were noted, followed by a sharp drop in subsequent years.



Graph 2. Temporal trend of the detection rate of leprosy cases among the elderly (N=896).

DISCUSSION

According to the results of the study, the predominant age group was 60-69 years, which was also observed in a survey of 60 elderly persons from two Rehabilitation Centers in São Luiz, Maranhão, of whom 53.3% were from the same age range as the present study[9]. In terms of gender, while it is known that leprosy affects men and women, some studies have indicated a prevalence among men, such as the World Health Organization's Global Leprosy Strategy 2016-2020: Accelerating Towards a World Without Leprosy, which found that only 36% of new cases in 2014 involved women[10].

A study carried out in Colombia, a country where the prevalence of the disease has been less than 1/10000 since 1997, identified a ratio of one case in women for every 3.4 in men, with a mean age of 53 years, in which half of the patients were over 51 years old and the maximum age was 90 years[11].

An epidemiological study that investigated cases in Brazil in 2001-2013 found that of 541,090 (99.5%) individuals, 54.8% were men and 17.5% were aged 60 years or older[12]. In Ribeirão Preto, a municipal region in the state of São Paulo, a study found that of the 434 cases of leprosy in the period 2006-2013, there was a prevalence among men, with 60.83% of the total[13]. In Araçatuba, São Paulo, an endemic municipal region in Brazil, a greater distribution was found among women, with 228 (52.5%) of 434 cases examined in 2015. However, the difference was only 22 patients, with 206 (47.5%) cases among men, which represents a reasonable difference. In terms of age group, 114 (26.3%) patients were 60 years of age or older[14].

This situation can be seen as a reflection of years of neglect of human health among men, who have become accustomed to not using health services and, consequently, have become more vulnerable to some diseases, especially serious and chronic illnesses. It was from this perspective that the Ministry of Health launched the National Policy for Integral Care for Men's Health in 2009, with the objective of encouraging health promotion actions aimed at this population[15]. Although leprosy can affect both genders, a reluctance to seek health care and being less concerned with the health–disease process, combined with an illness with chronic characteristics and transmission through intimate and prolonged contact, may combine to cause a prevalence of cases among this gender, contributing to an increased risk of illness[16].

The sociodemographic data of the state of Alagoas is in keeping with the global reality regarding

the process of population aging and the reduction of the fertility rate. Most of the population is made up of women, who have a life expectancy ten years greater than men. The gender ratio in the year 2015 was 91.7; while in the northeast of Brazil it was 93.8 and in the country as a whole it was 94.3. Of the municipal regions of the state, 58 out of 102 are classified as extremely poor, and the population of 12 municipal regions live in so-called 'subnormal communities', with a monthly income of between ¼ and ½ minimum wage[17, 18].

In 2015 the illiteracy rate in the state was 20.0; while in the northeast it was 16.0 and in Brazil it was 8.0. This demonstrates the extent to which the state trails the national average in literacy and reflects the epidemiological indicators of the population. The unemployment rate is also above the average for the northeast and for Brazil, with a value of 15.3 for Alagoas; 10.3 for the northeast and 9.6 for the country as a whole[18].

Health indicators based on the variables of ethnicity/skin color in cases of leprosy in Brazil reveal that the disease dominates among the black/brown population, with 31,064 new cases detected in 2014. Of these, 21,554 cases occurred among the black population. Therefore, the Ministry of Health recommends a temporal study on this variable and the disease to understand distribution among this population group[4].

In view of this, the present study does not contradict reality, as the occurrence of the disease was concentrated among illiterate individuals without a source of income and mixed-race individuals. As a public health problem, leprosy is strongly related to social context, reflecting the determinants and conditions of health to which the individual is submitted, which contributes significantly to an increased risk of illness, in addition to adding to the stigma and neglect of the disease, also linked to social conditions, making it difficult to tackle this public health problem[19].

In general, leprosy can be classed as BP, which includes the indeterminate and tuberculoid clinical forms; and MB, which are the dimorphic and Virchowian forms. The operational classification is based on the number of dermatological lesions, with PB cases containing up to five lesions and MB cases having more than five lesions[20].

The present study found a predominance of the dimorphic clinical form and, consequently, of multibacillary cases, with more than five dermatological lesions. In terms of smear microscopy, the number of ignored and unrealized cases stands out. An epidemiological study carried out in Fortaleza, Ceará, between 2007 and 2011, obtained the same findings as the present study. The prevalent clinical form was dimorphic (48.0%), followed by tuberculoid (31.4%). MB cases accounted for more than half of the cases (65.4%); while in Fortaleza smear microscopies were not performed in only 1.7% of cases[21]. Data were similar to a study from the African continent conducted between 2005-2013, since the dimorphic clinical form and the MB operational classification prevailed, in addition to more than five tegumentary lesions[22].

Deformities and physical disabilities are the main problems of the disease, generating physical and psychological harm, linked to a feeling of exclusion, stigma and prejudice that damages the health of the individual, as well as impairing the productive and financial development of the patient and affecting their family members[23].

As for the grade of disability, there was a great concentration of 'not assessed' and 'ignored' answers in the diagnosis, along with an increase in this situation upon discharge. This reveals the negligence of health professionals with respect to their patients, since evaluation assists prevention and planning for the promotion and continuity of health care[24].

The problem of incomplete data has been identified in other studies, which offer strategies to minimize the situation and strengthen epidemiological surveillance: the technical training of health teams working in health services where the incidence of the disease and underreported or incomplete data of cases is most exxpressive[25], and the allocation of people with training in health surveillance to collaborate in the investigation and follow-up of cases[26].

In a study conducted in Aracaju, capital of the state of Sergipe, with 2,358 patients, a predominance of grade zero (1,692 - 71.8%) disability was observed. A cross-sectional study conducted in Fortaleza from November to December 2010 with a sample of 51 patients obtained some sociodemographic data similar to Alagoas. In terms of disability, 25 (49.1%) patients with grade I or II disability were identified, while 14 (27.5%); 11 (21.6%) and 26 (51.0%) of clients had grade zero disability[27]. According to the Ministry of Health, grade zero disability at the time of diagnosis is a national trend, revealing the importance of early diagnosis of notified cases as a leprosy control strategy[4].

Neural impairment arises because the Hansen bacillus has a predilection for the peripheral nerves. It is therefore imperative that health professionals perform a neurofunctional evaluation, both at the time of diagnosis, halfway through treatment and at discharge, to investigate possible neurological disorders and allowing them to be treated quickly, aimed at the prevention of harm[28].

A considerable portion of the patients in the present study were not assessed at the time of diagnosis. This fact is even more serious when it comes to the elderly, as more than half of those investigated were MB, which can result in possible neural damage in patients who are already at risk of functional deficit.

The detection rate represents new cases per 100,000 inhabitants over a certain period[29]. In 2014, 213,899 patients were diagnosed globally, with 94% of this total concentrated in 13 countries, among which Brazil ranked second. In the elderly population in Alagoas, the detection rate of the study was above 20 per 100,000 inhabitants, with an average of 29.48, considered hyperendemic according to the parameters of the Ministry of Health.

CONCLUSION

It was found that an evaluation of physical disabilities caused by leprosy was carried out at diagnosis, there was a high proportion of cases with a grade 1 or II disability at the time of diagnosis, as well as a prevalence of multibacillary patients, indicating the need for improved early detection. There was a notable frequency of 'not evaluated' and 'ignored' physical disability, indicating that priority should be given to improving the notifications regarding such patients and investigating the difficulties faced by health professionals when registering such information.

Adequate and effective treatment against leprosy exists, but the required coverage of health services must be maintained, eliminating this pathology through a reduction in prevalence. Likewise, the disease can have negative implications in the lives of the elderly, with risks and harm for the social life of the individual.

It is important to understand the situation of the elderly population with leprosy in terms of their sociodemographic data. In this way, interventions to support recovery from leprosy, a disease with serious consequences if not treated early, can be made. National and international data on this theme are scarce. The present study provides information on the epidemiological profile of the elderly in Alagoas, contributing to the knowledge of the scientific community.

In conclusion, it is important to recognize the health situation of elderly persons who are carriers and ex-carriers of leprosy in the state of Alagoas, as knowing the epidemiology of the disease in this group allows the key components of health care to be identified, with the aim of minimizing the chances of the disease worsening.

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Relation between family functionality and the household arrangements of the elderly

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Abstract

Objective: to verify the association between family functionality and the household arrangements of the elderly in an urban area of Minas Gerais. *Method:* a quantitative, household survey type study that was analytical, cross-sectional and observational in nature was carried out with 637 elderly persons. The Mini Mental State Examination, a characterization of sociodemographic and economic data and the Family Apgar test were used. Descriptive analysis was performed by absolute and relative frequencies for the categorical variables. The Chi-squared test (p <0.05) was used to identify relationships between household arrangements and family functionality. *Results:* elderly women (66.6%), aged 60 to 70 years (42.1%), who were married (42.7%), and received the minimum wage (45.1%), with up to four years of education (51%) predominated. It was found that the majority of the elderly persons interviewed (87.8%) considered their family as a unit of care with good functionality. There was a significant association between poor family functionality and elderly individuals who lived alone (p = 0.007). *Conclusion*: it is important to understand the family dynamics of the elderly so that multidisciplinary teams can promote actions and interventions aimed at the needs of each family, helping to strengthen family relationships.

Keywords: Family Relations. Elderly. Family.

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INTRODUCTION

Longevity requires a greater need for care. The family is therefore fundamental to the elderly person, representing an informal network of support for this population group[1,2]. In the present study, those who cohabit with the elderly are considered family.

The family fulfills an important role in society, especially among the elderly population and particularly in relation to support, protection, belonging and affect[3]. It is a complex and unique context with interactions that must be explored and a network of relationships in which the attitudes of one member affect the whole group[4].

Due to the social evolutions of recent times, the concept of the family has undergone constant transformations, giving rise to new types of organization, structure, culture, religion and relationships, which are often difficult to understand[5]. Such changes in family composition have occurred due to the greater participation of women in the labor market, low fertility rates and the aging of the population, triggering intergenerational conviviality[6]. In this context, changes in the contributions and attributions of different family members occur.

In the last year 30.6% of the elderly, mainly women (33.3%), were found to live with their children or another relative. The proportion of elderly men living alone was 15.1%, while for elderly women it was 17.8%. Therefore, 84.9% of Brazilian elderly persons lived with some kind of family relation. A total of 29% of households contained at least one elderly person aged 60 or over[7].

Since 1960, the structure of families has been changing, due to characteristics of modern society such as individualism, resulting in significant changes in intra-family relationships[8,9]. In Brazil, the number of people living alone, including the elderly, has increased. This has occurred due to issues related to the demands of modernity that value individualism, but also by factors such as: changes in cultural behavior, more common marital separation and increased life expectancy[9].

Household arrangements are concerned with the number of members that make up a family unit as well as the consanguineous and generational relationships between them[10]. Living together with children and grandchildren is normally determined by the degree of physical incapacity and financial needs of the elderly[10].

The existence of socio-historical-cultural aspects as well as political, economic and demographic factors influences the configuration of household arrangements involving the elderly. Thus, the type of arrangement does not depend exclusively on the decision of the elderly person and their relatives[9]. For example, living in the urban environment produces a greater sense of individualism in people, which in turn can influence the constitution of household arrangements. In such cases there are a greater number of people who have chosen to live alone[9].

The affective function of the family is extremely important. In a functional family system both emotional and affective aspects are present. From the perspective of family functionality, members tend to deal with conflicts and adversities in order to achieve emotional stability, using their own resources for effective solutions[11,12]. Also related to family functionality is the distribution of roles and support among the members of the family[4,13].

Conversely, in a context of poor family functioning, the care capacity of family groups may be impaired, which makes them unsuccessful at adequately meeting the care needs of their elderly relatives. This fact could lead to impairment in the process of autonomy and quality of life of the elderly[14]. Poor functionality is associated with the inability to cope with crisis situations and the failure to perform essential functions such as: adaptation, companionship, member development, affectivity, and problem solving ability[15].

Family functioning is threatened by conditions that lead the elderly to depend on the family, such as chronic non-communicable diseases. The difficulties of family adjustment and reorganization related to these pathologies are based on negative emotional patterns that may influence family life[15,16]. The household arrangement is capable of improving or further impairing the dynamics of the family and the quality of life of the elderly[17,18].

This issue is worrying, as longevity accompanied by Noncommunicable Chronic Diseases (DCNT)

and disabilities consequently increases the number of elderly people who require care by professionals and especially the family. For the elderly, the family is their mainstay, and this support becomes essential for coping with problems and satisfaction in family relationships and life.

The objective of the present study was therefore to verify the association of family functionality with the home arrangements of the elderly in an urban area.

METHOD

A household survey type study with a quantitative-analytical, observational and cross-sectional approach was carried out with elderly persons living in the community from a municipal region in the rural part of the Triângulo Mineiro region, Minas Gerais.

The population was composed of elderly people aged 60 years and over of both genders, a group which was estimated for the urban area as being 315,360 inhabitants. We included individuals aged 60 years or older; residents of the urban area; who were without cognitive decline according to the Mini Mental State Exam (MMSE)[19] score. The cut-off point for cognitive decline was the level of schooling of the respondent, corresponding to 13 points for those who were illiterate, 18 points or less for those with 1 to 11 years of schooling and 26 points for over 11 years of schooling.

It is worth noting that the multi-stage cluster sampling process of the present study is part of a larger study entitled "Dependence in activities of daily living, frailty and the use of health services among elderly people in the Triângulo Mineiro" developed by the research group in Public Health of the Universidade Federal do Triângulo Mineiro (UFTM), the sample size of which was calculated as N=711. Although the sample size was calculated for multiple correlations, in accordance with the larger study, the present study discusses the results of bivariate analyzes.

The selection of the elderly persons was by arbitrary drawing of 50% of the urban census tracts of the municipal region, according to a single list of said tracts (N = 409), with 204 sectors obtained. Sectors with no elderly persons, without homes and those that did not include the number of elderly residents were excluded, as well as individuals who were not located after three attempts.

The number of interviews was divided by the census tracts drawn. These were conducted in the home by trained researchers (undergraduate and graduate students in the area of health) and were reviewed by field supervisors (teachers and post-graduate students). The first household to be interviewed was randomly selected and the subsequent interviews were carried out in the households in a standardized manner until the sector was saturated. The number of households/elderly persons was considered as four elderly persons per census tract.

Data collection occurred from January to April 2014, in the respective residences of the elderly.

Regarding the study variables, the sociodemographic aspects were: gender (female/male), age group (60-70, 70-80, 80 or over), marital status (single, married or living with partner, widower, separated/divorced), schooling (no schooling, 1-4, 4-8, 8 or more), monthly individual income (<1; 1; 1-3; 3-5; >5); using an instrument prepared by the authors, who were part of the Research Group in Public Health/UFTM[20].

The Family Apgar, developed by Smilkstein (1978) and translated and adapted transculturally in Brazil in 2001 by Duarte[21] was used to measure family functioning. This instrument evaluates the dynamics of the family in relation to five aspects: Adaptability, Partnership, Growth, Affection, and Resolve. The answers are selected from: 0 = never, 1 = rarely, 2 = sometimes, 3 = almost always and 4 = always. The total score is classified as: high familial dysfunction - 0 to 8; moderate family dysfunction - 9 to 12 or good functionality - 13 to 20 points.

A descriptive analysis of the categorical variables was performed based on absolute and relative frequencies. To verify the association between family functionality and household arrangement, the chi-squared test was performed, considering a level of significance of $p<0.05$. A database was organized in a spreadsheet by independent double entry. Inconsistencies were observed and the research instruments were reapplied to correct them. For the statistical analysis, the information was transposed to the "Statistical Package for Social Sciences" (SPSS) version 21.0 software package.

The study was approved by the Ethics Research Committee of UFTM, under protocol Nº 493.211. The Free and Informed Consent Form was signed by all the participants of the research, following the precepts established by Resolution 466/12, dated 12/12/2012, of the Ministry of Health[22].

RESULTS

Of the 711 elderly persons, 637 elderly were analyzed in the present study, with refusals, Apgar answered by the caregiver/relative and withdrawals considered as losses. The reasons for withdrawals given by the elderly were: health problems at the time of the interview, commitments outside the home, visitors or because they found the questionnaire too long. A total of 637 elderly people therefore participated.

In relation to socio-demographic and economic data, there was a higher percentage of elderly women, aged 60-70 years, who were married, had 1-4 years of schooling, an income of one minimum salary and lived with others (Table 1).

There was a predominance of interviewees who considered their family relationship to have good functionality (87.8%), while only 5.8% had families with fair functionality and 6.4% had poor functionality.

Table 2 shows the association between family functionality and home arrangement.

Table 1. Distribution of elderly persons according to sociodemographic and economic variables. Uberaba, Minas Gerais, 2014.

Variables	n(%)
Gender	
Male	213(33.4)
Female	424(66.6)
Age group	
60-70	268(42.1)
70-80	234(36.7)
80 or more	135(21.2)
Marital Status	
Single	47(7.4)
Married or live with partner	272(42.7)
Widow/widower	254(39.9)
Separated\divorced	64(10.0)
Schooling (in years of study)	
No schooling	131(20.6)
1-4	325(51.0)
4-8	54(8.5)
8 or more	127(19.9)
Monthly Individual Income (in minimum salaries) *	
No income	60(9.4)
<1	15(2.4)
1	287(45.1)
1-3	207(32.5)
3-5	42(6.6)
> 5	26(4.1)
Household Arrangement	
Lives alone	129(20.3)
Lives with others	508(79.7)

*According to the Department of Statistics and Socioeconomic Studies (DIEESE), the minimum salary in 2014 was 724 *reais*.

Table 2. Association between family functionality and the household arrangements of the elderly. Uberaba, Minas Gerais, 2014.

	Household arrangement		
	Lives alone (n%)	Lives with others (n%)	*p*
Family functioning			
Poor	16 (12.5)	25 (4.9)	0.007
Fair	6 (4.7)	31 (6.1)	
Good	106 (82.8)	453 (89.0)	

The results of the chi-squared test identified an association between family functionality and household arrangement, with those who lived alone having poor functionality (p = 0.007) in comparison with those that lived with others.

DISCUSSION

The predominance of women in this study is consistent with other studies in literature [8-12,18,23,24,25-27]. These data corroborate the greater life expectancy and health concerns of the elderly female population in Brazil and in most countries of the world [1,7].

Regarding the predominant age group (60-70), the data are consistent with other studies that consider the relationship between the elderly and family relationships and their support network [18,26].

Regarding marital status, Brazilian studies found higher prevalences of married elderly persons in three municipal regions: Poços de Caldas, Minas Gerais (52.4%), Campinas, São Paulo (51.8%) and Ivoti, Rio Grande do Sul (53.3%). The prevalences of widows found in the municipal regions of Parnaíba, Piauí (38.1%), Campinas, São Paulo (38.5%) and Ivoti, Rio Grande do Sul (40.6%) were similar to those of the present study[28].

In terms of schooling, more than half (51%) of the respondents reported having 1-4 years of schooling and 20.6% had no schooling, a result similar to a study of elderly persons living in the community in the east of São Paulo, which had findings of 61.6% and 18%, respectively[29]. In another study with the elderly in Campinas, São Paulo, similar percentages were found to our study (54.2% and 18.2%),[28].

Low levels of schooling impair self-care,[30] access to information, the obtaining of one's rights, absorption of knowledge and health awareness[31].

The low income of the elderly persons interviewed corroborates the values found in some regions of Brazil, where 41.6% have an income of one minimum salary. The majority of this group of elderly persons live in the north (59.6%) and northeast (61.2%) of the country[7]. A study conducted in Dourados (Mato Grosso) with 374 elderly people found that 51.9% had a per capita income of half a minimum wage[27].

Restrictions imposed by one's financial situation can affect access to health and self-care and may lead to housing deprivation, family abandonment, the loss of assets and impact on family relationships[18, 25].

The predominance of elderly persons who lived with others was also found in studies carried out in Mato Grosso do Sul (80.5%)[27], Bahia (77.7%)[25] and Goiás (81.5%)[16]. The percentages of elderly individuals who said they lived alone were similar to those found in the FIBRA (Network for the Study of Frailty in the Brazilian Elderly) network in the cities of Poços de Caldas (Minas Gerais) (19.8%) and Ivoti (Rio Grande do Sul) (21.3%)[28].

It is essential for professionals to strengthen the bond between elderly persons, their families and health professionals, since the elderly believe that the family is a source of support and security, as well as being a foundation for dealing with difficulties and care[31].

In addition, guidance on rights and guarantees of the elderly should be provided, strengthening family ties so that they can have a healthier old age[31], and thus better family functionality[12].

Living with relatives is desired by the elderly, since they believe their loved ones will provide attention and care when necessary, although the family's capacity to do so may be impaired[32]. Knowing how families relate involves guidance in clinical practice, enabling family members to live together in a more healthy and harmonious manner.

Regarding the evaluation of family Apgar, some studies with the elderly have found good family functioning (76.3%, 85% and 85.19%, respectively) [17,25,33], as did the present study. A functional family can provide the elderly with the support and security they need at this stage of life[27].

Individuals who lived alone were associated with families with poor functionality, corroborating the findings of other studies[16,17]. Poor social support and a precarious bond with relatives can result in family insufficiency in the elderly[34]. The aging process requires more support and care from families. This should accompany the experience of growing old, identifying possible difficulties and promoting better living conditions[34].

Elderly persons who live alone experience moments of loneliness, insecurity, sadness, low self-esteem, triggering social isolation which, once installed, tends to be accentuated, hampering family ties[34]. A lack of dialogue, reduced family and social support, limited family time, and lack of participation in decision-making processes may compromise the family functioning and general health conditions of the elderly[16,34].

Living with other people allows greater intimacy and closeness, promoting affect, reciprocity and stability for the elderly in order to allow harmonious relationships[18]. At the same time, living in and with families with people of different generations can be conflicting and even trigger poor functionality in families. However, it differs from living alone if there is understanding, respect and acceptance to overcome difficulties[18]. The elderly today have assumed new roles of responsibility, commitment and care, characterized by respect and greater participation in family relationships, which can contribute to balance and better family functionality[11,18].

Living alone has a negative effect in comparison with living with another person as being alone can impair self-care, cause functional decline, and lead to a greater propensity for depression. In addition, it can cause both social isolation and inferior family relationships, as it can result in the lack of a caregiver[16, 27, 34].

In this sense, professionals should advise the elderly and their families about the importance of social support networks and establish a network of care, especially for those who live alone [26].

In terms of limitations, one of those faced by the present study is the lack of investigations for comparison.

Despite not reaching all the sample proposed in the research plan, the phenomenon was studied among 637 community-based elderly persons, which makes it possible to generalize the findings to similar populations.

Another limitation is the cross-sectional design of the study, meaning family functionality was assessed in a single moment. A critical event, which may not be recurrent, may therefore have affected this perception among the elderly. However, considering the gap in scientific production on the subject, the analysis carried out provides proposals for the understanding of family functioning and household arrangements among the elderly population.

CONCLUSION

The present study found a predominance of elderly women, aged between 60 and 70 years, who were married, had four years of schooling, earned minimum wage and lived with others. Most considered their family functioning to be good. Poor family functioning was associated with elderly persons who lived alone.

It is therefore important to identify the family dynamics of these elderly persons, so that multidisciplinary teams can offer actions and interventions geared to the needs of each family, promoting the strengthening of family relationships.

The present study provides a basis for the development of new research on the elderly and family functionality. Studies with elderly persons

living alone and the available sources of social support are suggested, as well as the evaluation of this support for the elderly population.

The results support the development of future studies on the application of instruments such as Apgar, which represents a reference for the recognition of the behavior of this variable in the community-residing elderly population. The analyzes undertaken also allowed associations to be established among the variables. These results can support multi-professional training and the improvement of teamwork when dealing with the family of the elderly.

It can also support reflection on programs and policies for the elderly who live alone and, therefore, cannot rely on the support of family functionality to manage their condition.

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Disability relating to instrumental activities of daily living in the elderly with rheumatic diseases

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Abstract

Objective: to characterize the sociodemographic profile of elderly persons with arthritis/rheumatism in relation to gender, as well as to estimate the prevalence and factors associated with functional disability for the performance of instrumental activities of daily living (IADL). *Method*: a cross-sectional population-based study with a sample of 1,136 elderly persons (≥65 years old) from seven Brazilian municipal regions was carried out. Functional capacity was assessed by the self-reports of the elderly in terms of the performance of IADL, using the Lawton Scale. Differences between the genders, according to sociodemographic variables, were verified by the chi-squared test ($p<0.05$). The prevalence of inability to perform IADL was calculated and the independent associations were verified through multiple logistic regression. *Results*: the mean age was 72.4 years, 79.1% of the sample were women, and 45.9% of the elderly with arthritis/rheumatism were dependent for the performance of IADL. Differences were observed between the genders in relation to age, marital status, income and household arrangements ($p<0.05$). A higher prevalence of disability was observed among older elderly persons, those with no schooling and lower incomes, who lived in multigenerational households and who were frail. In the evaluation of the performance of specific activities, elderly persons with arthritis/rheumatism had greater difficulty taking medication (OR: 1,90; CI 95%: 1.19 - 3.06), after adjusting for gender and age. *Conclusion*: associations were found between functional disability and sociodemographic variables and frailty. Independence in daily activities such as those evaluated in this study is one of the primary conditions for the well-being of the elderly, even in conditions of frailty or chronic diseases.

Keywords: Elderly. Aging. Activities of Daily Living. Rheumatic Diseases. Cross-Sectional Studies.

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INTRODUCTION

The ageing of the Brazilian population in recent decades, together with changes in epidemiological patterns and structure and social and family behavior, have resulted in new needs, including a restructuring of health and social policies[1]. The ageing process involves a greater occurrence of chronic diseases[2,3] and a higher frequency of functional disability, which is characterized by restrictions in the physical and mental skills required for an individual to maintain their independence and autonomy in the performance of basic activities of daily living as well as activities of greater complexity[4].

The performance of activities of daily living depends on the general health status and motor functions of the individual. These are most impaired in situations of acute adverse health conditions, morbidities, cognitive decline and the occurrence of multiple chronic conditions, which are common among the elderly[5]. Rheumatic diseases have a greater impact on years of life with disability[6].

Rheumatic diseases are defined as health problems that affect the connective tissues, causing harm to the skin, heart, joint structures and periarticular structures. There are approximately 100 of such diseases, which are usually chronic and involve pain, joint stiffness and physical disability. Moreover, studies have demonstrated a high prevalence rate of rheumatic diseases in the elderly population[2,7,8]. Data from the 2008 Brazilian National Household Survey demonstrate prevalence rates of 21.3%, 26.3% and 31.5% among individuals aged 60 to 69 years, 70 to 79 years and 80 years or older, respectively[2]. Factors such as the female gender, advanced age, a sedentary lifestyle, excess weight, low socioeconomic status and smoking, among others, are associated with the development of rheumatic diseases[9,10,11].

There are few population-based studies in Brazilian scientific literature that evaluate functional capacity in elderly persons with specific chronic diseases. Therefore, the aims of the present study were to characterize the socio-demographic profile of elderly persons with arthritis and rheumatism, stratified by gender, estimate the prevalence of functional disability in the performance of instrumental activities of daily living, determine the associated factors and compare levels of dependence for each instrumental activity of daily living among elderly persons with and without rheumatic diseases.

METHODS

The present study was conducted with data from a study on frailty among the elderly conducted in 2008/2009 (FIBRA network – Network of Studies on Frailty among the Brazilian Elderly). A population-based cross-sectional study was conducted with a sample of 3478 older adults (≥ 65 years) recruited from the community, of whom 1136 reported having a medical diagnosis of arthritic or rheumatism. The participants were residents of urban areas in six cities: Campinas in the state of São Paulo, Belém in the state of Pará, Parnaíba in the state of Piauí, Campinas Grande in the state of Paraíba, Poços de Caldas in the state of Minas Gerais, Ivoti in the state of Rio Grande do Sul and the subdistrict of Ermelino Matarazzo in the city of São Paulo, which were selected by convenience.

In each location, a number of representative urban census sectors were drawn by simple lottery. For each sector, the population of men and women in three age groups (65 to 69 years, 70 to 79 years and 80 years or older) sufficient to represent the respective realities was estimated.

The census sectors were visited and the residents were contacted in their homes by a team of trained interviewers (university students, community health agents and volunteers from religious organizations)[12] until the desired samples were obtained, plus 50% to compensate for possible dropouts. The interviews were held *a posteriori* at a previously announced public location. The individuals were provided with information on the objectives, content, conditions and ethical aspects of the study. Those who agreed to participate received a card with the date, time and location of the interview.

In this phase, elderly persons with deficits in terms of memory, attention, spatial/temporal orientation and communication suggestive of cognitive deficit (observed by the recruiting team) were excluded. At the criteria of the recruiters, individuals with severe mobility, speech or affectivity impairment associated with advanced Parkinson's disease, those with the permanent or temporary inability to walk

(except those who used a gait-assistance device), those with localized loss of strength and aphasia stemming from a stroke, those with severe hearing or visual impairment and those in the terminal stage were excluded[12].

The individuals who attended the scheduled locations again received clarifications regarding the objectives and conditions of the study and signed a free and informed consent form.

Data were collected using a previously tested questionnaire administered by trained interviewers. At the beginning of the interview, all individuals were submitted to the Mini Mental State Examination[13,14], the score of which was used to exclude individuals with cognitive impairment suggestive of dementia (cutoff points: 17 for illiterate individuals, 22 for those with one to four years of schooling, 24 for those with five to eight years of schooling and 26 for those with nine or more years of schooling). Based on this criterion, 883 individuals were excluded, leaving a sample of 2593 older adults who responded to the items of interest for the present study.

Individuals with rheumatic disease were identified based on the answer to the following question: "*Has a doctor told you that you have arthritis or rheumatism*?" (yes or no). Functional capacity was evaluated based on self-reports regarding the amount of assistance (none, partial or complete) needed for the performance of instrumental activities of daily living (IADLs) (eight items on the Lawton Scale)[15]. Individuals who reported requiring partial or complete assistance for one or more activities were classified as dependent.

The following were selected as the independent variables for the analysis of factors associated with functional capacity:

Socio-demographic characteristics: gender (male or female), age group (65 to 69; 70 to 74; 75 to 79; ≥ 80 years), marital status (married, single/divorced/widowed), schooling (0, 1 to 4, ≥ 5 years of study), household income based on the Brazilian monthly minimum wage (MW) at the time of the study (< one MW; one to three times the MW; more than three times the MW) and living arrangement (lives alone, lives only with spouse, lives with descendents, spouse/descendents/other relatives and external/mixed arrangement).

Care expectations: determined based on the answer to the following question: "*If you need help doing any of these activities (IADLs/BADLs), do you have anyone you can rely on?"* Based on the possible responses (alone, spouse only, spouse and son/daughter, son/daughter and grandchildren, other relatives/friends/health professional*;* this variable was dichotomized as "no" (alone) or "yes" (other answers).

Perception of self-care: evaluated on a scale with five degrees of intensity (excellent, good, fair, poor and very poor) based on the answer to the following question: *"How do you rate the care that you dedicate to your health?"*

Indicators of frailty: the five criteria proposed by Fried et al. (2001) were considered[16] (unintentional weight loss in previous year, fatigue, weakness, slowness and low level of physical activity). Individuals with three or more components were classified as frail, those with one or two components were classified as pre-frail and those with no components were classified as non-frail.

Self-rated health: determined based on the answer to the following question: "*In general, how would you rate your health?*" The responses were categorized as excellent/good and fair/poor/very poor.

The socio-demographic distribution of the older adults with arthritis or rheumatism was determined based on relative frequencies stratified by gender, and the differences between the groups were verified. The comparisons were performed using the chi-squared test with a 5% significance level. The prevalence of disability regarding the performance of specific IADLs was estimated according to the presence/absence of arthritis or rheumatism. Odds ratios (OR) adjusted for gender and age and respective 95% confidence intervals (CI) were also calculated.

Crude and adjusted (gender and age) ORs and respective CIs of 95% were estimated to identify factors associated with functional capacity in the performance of IADLs in elderly persons with arthritis or rheumatism. Variables with a p-value<0.20 in the simple analysis were incorporated into the multiple regression model. The backward selection method was employed and only those variables with a p-value < 0.05 remained in the final model. The Stata 14.0 program was used or all statistical analyses.

This study was approved by the Human Research Ethics Committee of the School of Medical Science of the *Universidade Estadual de Campinas* (certificate number: 208/2007, May 22nd, 2007; certificate number: 0151.1.146.000-07) and again on December 10th, 2014 (certificate number: 39547014.0.1001.5404).

RESULTS

Among the 1136 elderly persons who reported having a medical diagnosis of arthritis or rheumatism, 79.1% were women, the mean age was 72.4 years (standard deviation: 5.6 years) and the maximum age was 96 years. A total of 45.9% (95% CI: 41.9 to 49.8%) of the individuals with arthritis or rheumatism were dependent in the performance of IADLs.

Table 1 displays the socio-demographic characteristics of the elderly persons with arthritis or rheumatism stratified by gender. A total of 28.7% of the men and 31.5% of the women were ≥ 75 years of age at the time of the interview and 63.0% of the women were single/divorced/widowed. The majority had ≤ four years of schooling and a household income ≤ three times MW. Regarding living arrangements, 6.4% of the men and 16.7% of the women lived alone (p< 0.001).

Table 2 displays the factors associated with functional disability in the performance of IADLs among the elderly persons with arthritis or rheumatism. The prevalence of functional disability was higher among those with no schooling, those with an income less than one MW in comparison to those with an income ≥3 MW at the time of the interview, those who lived with a son/daughter or a spouse and son/daughter or other living arrangements and those classified as frail or pre-frail. Regarding self-rated health, 54.0% of the elderly persons with arthritis or rheumatism considered their health to be fair, poor or very poor and the prevalence of functional disability was higher in this subgroup (OR =1.67; 95% CI: 1.18 to 2.36).

Table 1. Socio-demographic characteristics of elderly persons with arthritis or rheumatism; FIBRA study, 2008-2009.

Variables	Total		Men		Women		p
	n	%	n	%	n	%	
Age group							0.009
65-69 years	421	37.1	84	35.4	337	37.5	
70-74 years	364	32.0	85	35.9	279	31.0	
75-79 years	219	19.3	31	13.1	188	20.9	
80 years or more	132	11.6	37	15.6	95	10.6	
Marital status							< 0.001
Married/civil union	511	45.0	179	75.5	332	37.0	
Single/divorced/widowed	624	55.0	58	24.5	566	63.0	
Schooling							0.477
None	277	20.0	46	19.4	181	20.2	
1 - 4 years	552	48.6	109	46.0	443	49.3	
≥ 5 years	356	31.4	82	34.6	274	30.5	
Monthly family income							0.017
< 1 MW*	252	22.2	43	18.2	209	23.3	
1 to > 3 times MW	498	44.0	97	41.1	401	44.7	
3 to < 5 times MW	224	19.8	49	20.8	175	19.5	
≥ 5 times MW	159	14.0	47	19.9	112	12.5	
Living arrangement							< 0.001
Alone	164	14.6	15	6.4	149	16.7	
With spouse	219	19.4	75	31.9	144	16.2	
With offspring	320	28.4	20	8.5	300	33.7	
With spouse and offspring	253	22.5	100	42.5	153	17.2	
Other relatives and non-relatives/others	170	15.1	25	10.6	145	16.3	

Source: FIBRA 2008-2009.

*Minimum wage.

Table 2. Prevalence of functional disability in instrumental activities of daily living and associated factors in elderly persons with arthritis/rheumatism; FIBRA study, 2008-2009.

Variables	Functional disability	OR_{crude}	95% CI	$OR_{Adjusted}$	95% CI
Gender					
Male	41.5	1		1	
Female	47.1	1.25	0.85 - 1.85	1.30	0.88 - 1.93
Age group					
65-69 years	37.4	1		1	
70-74 years	47.4	1.50	1.02 - 2.22	1.53	1.03 - 2.26
75-79 years	50.0	1.67	1.07 - 2.61	1.65	1.06 - 2.58
≥ 80 years	62.7	2.81	1.60 - 4.93	2.89	1.64 - 5.10
Marital status					
Married/civil union	42.1	1		1	
Single/divorced/widowed	48.7	1.30	0.94 - 1.80	1.10	0.77 - 1.56
Schooling					
None	67.5	1		1	
1 - 4 years	43.2	0.37	0.23 - 0.57	0.38	0.24 - 0.59
≥ 5 years	36.7	0.28	0.17 - 0.45	0.31	0.19 - 0.50
Monthly family income					
< 1 MW*	50.3	1		1	
1 to < 3 times MW	51.4	1.04	0.70 - 1.56	1.04	0.69 - 1.57
≥ 3 times MW	34.2	0.51	0.33 - 0.80	0.53	0.33 - 0.83
Living arrangement					
Alone	34.6	1		1	
With spouse	35.0	1.02	0.55 - 1.89	1.24	0.65 - 2.36
With offspring	53.6	2.18	1.26 - 3.78	2.33	1.33 - 4.09
With spouse and offspring/others	48.0	1.74	1.03 - 2.96	2.03	1.18 - 3.52
Care expectations					
No	52.1	1		1	
Yes	45.9	0.78	0.43 - 1.41	0.82	0.45 - 1.50
Perception of self-care					
Very good/good	45.3	1		1	
Fair/poor/very poor	46.7	1.06	0.77 - 1.45	1.09	0.79 - 1.51
Frailty					
Non-frail	36.1	1		1	
Pre-frail	50.0	1.77	1.25 - 2.50	1.70	1.20 - 2.41
Frail	64.3	3.18	1.73 - 5.84	2.94	1.59 - 5.43
Number of chronic diseases					
None or one	43.0	1		1	
Two or more	47.9	1.22	0.88 - 1.69	1.19	0.85 - 1.65
Self-rated health					
Very good/good	41.9	1		1	
Fair/poor/very poor	54.0	1.63	1.16 - 2.29	1.67	1.18 – 2.36

Source: FIBRA 2008-2009.

*Minimum wage.

In the multiple regression analysis, functional disability was more frequent among individuals with lower schooling and income, those who lived with a spouse/descendent or who had other living arrangements and those with some degree of frailty (Table 3).

Table 4 lists the IADLs on which the elderly persons were dependent stratified by the presence/absence of arthritis or rheumatism. A significant difference between groups was found for taking prescription medications (OR: 1.90; 95% CI: 1.19 to 3.06) after the adjustments for gender and age.

Table 3. Multiple regression analysis for functional disability in instrumental activities of daily living among elderly persons with arthritis/rheumatism; FIBRA study, 2008-2009.

Variables	$OR_{adjusted}$ (95% CI)	*p*-value	Standard error
Age group			
65-69 years	1		
70-74 years	1.52 (1.01 - 2.29)	0.048	0.319
75-79 years	1.35 (0.84 - 2.17)	0.219	0.327
≥ 80 years	2.50 (1.37 - 4.55)	0.003	0.765
Schooling			
None	1		
1 - 4 years	0.42 (0.26 - 0.67)	< 0.001	0.100
≥ 5 years	0.37 (0.22 - 0.62)	< 0.001	0.097
Monthly family income			
< 1 MW*	1		
1 to < 3 times MW	0.91 (0.59 - 1.42)	0.693	0.206
≥ 3 times MW	0.59 (0.36 - 0.96)	0.036	0.148
Living arrangement			
Alone	1		
With spouse	1.31 (0.67 - 2.56)	0.425	0.448
With descendants	2.47 (1.38 - 4.41)	0.002	0.732
With spouse and descendants/others	2.24 (1.26 - 3.95)	0.006	0.650
Frailty			
Non-frail	1		
Pre-frail	1.58 (1.10 - 2.28)	0.014	0.294
Frail	2.49 (1.30 - 4.76)	0.006	0.824

Source: FIBRA 2008-2009.

*Minimum wage.

Table 4. Dependence in instrumental activities of daily living among elderly persons according to the presence/absence of arthritis or rheumatism; FIBRA study, 2008-2009.

Instrumental activities	Arthritis or rheumatism				*p*	$OR_{adjusted}$	95% CI
	Yes		No				
	n	%	n	%			
Using telephone	99	45.6	118	54.4	0.979	0.95	0.70 - 1.28
Using means of transportation	74	45.7	88	54.3	0.941	0.80	0.57 - 1.13
Shopping for groceries	122	52.4	111	47.6	0.019	1.13	0.84 - 1.52
Housework	149	48.4	159	51.6	0.244	1.09	0.83 - 1.42
Preparing meals	68	38.9	107	61.1	0.061	1.15	0.80 - 1.63
Managing money	90	49.5	92	55.5	0.244	1.02	0.74 - 1.42
Taking medications	50	61.0	32	39.0	0.004	1.90	1.19 - 3.06

Source: FIBRA 2008-2009.

DISCUSSION

Inequalities were found in the prevalence of functional disability in the performance of IADLs among elderly persons with rheumatic diseases. There was a greater rate of disability among those with a poorer socioeconomic status and those classified with some degree of frailty (one or more of the five frailty components). No significant associations were found between functional disability and gender, marital status, care expectations, perception of self-care or morbidities.

Among individuals aged 70 years or older, the disease is more prevalent in women who live alone. Elderly women are more numerous than elderly men, and this difference increases over the years[17]. The predominance of women at more advanced ages is a result of many factors, including the tendency among women to take better care of themselves and seek medical and/or social care[17]. Gender differences in the health of elderly persons reveal that elderly women suffer a greater burden of functional decline[18]. Especially with regard to rheumatic diseases, studies report higher prevalence rates of osteoarthritis and rheumatoid arthritis in women[8,11].

The prevalence of disability regarding the performance of IADLs among elderly persons with arthritis or rheumatism was 46.0% in the present study, demonstrating that nearly half of these individuals had restricted independence in terms of daily activities related to mobility or housework[4]. Literature offers little data on the prevalence of functional disability in the performance of IADLs in this subgroup of elderly persons. Chronic inflammatory joint diseases cause constant, prolonged pain that exerts a considerable impact on the lives of affected individuals, rendering them unable to perform day to day tasks[19]. A previous study has identified an association between limited mobility and functional disability in patients with rheumatic disease[20].

In the present study, functional disability was more prevalent among individuals with lower schooling and income as well as those who lived with a spouse and offspring or had other living arrangements. Non-communicable chronic diseases generally have a greater effect on populations with low schooling and income[2,21], who are more vulnerable and more exposed to risks and have less access to healthcare services[2,22,23].

A previous study involving individuals with rheumatic diseases found an association between low socioeconomic status and a greater prevalence of functional disability[24]. The successive accumulation of social needs throughout the life cycle of the individual, which is reflected in multi-generational living arrangements, exerts a negative influence on adherence to practices of health promotion and disease prevention, with impacts on disease control and functional independence during the ageing process. Inequalities regarding the distribution of income and a low level of economic protection for elderly persons make inequality more severe in this segment of the population.

Frailty is considered a clinical syndrome associated with normal physiological ageing and is described as a clinical state of increased vulnerability expressed as reductions in both compensatory responses and the maintenance of homeostasis in the presence of stressors[16]. The greater prevalence of disability regarding activities of daily living among elderly persons classified as pre-frail or frail in the present study may be related to the high prevalence of pain in the population with arthritis[25,26] as well as the frailty syndrome, which predisposes elderly persons to a reduction in muscle mass and a chronic inflammatory state[16].

Differences in age and gender composition were considered in the analysis of functional disability with regard to each specific instrumental activity, as functional decline is a progressive process[27] associated with both an increase in disease burden and considerable health differences between ageing men and women. After adjustments for age and gender, a greater prevalence of disability was found among the elderly persons with arthritis or rheumatism in terms of taking prescription medications. This declared difficulty and the need for assistance regarding the use of medications should be considered by both health professionals and family members so that they can assist these elderly persons in adhering to medical treatment. The low level of schooling of elderly persons should also be taken into consideration when providing medical counseling.

Limitations of the present study include the use of self-reported information and the impossibility of establishing causal relationships due to its cross-sectional design. Irrespective of the health condition evaluated, older populations have a greater likelihood of developing diseases and disabilities than those in locations where the elderly are concentrated in a younger age group[27]. However, the present study considered elderly persons residing in the urban areas of seven cities located in the southern, southeastern, northern and northeastern regions of Brazil, with different demographic profiles. Studies addressing basic and advanced activities of daily living can help clarify the impact of rheumatic diseases. Moreover, qualitative approaches can contribute to a better understanding of the difficulties relating to the use of medications.

Independence in the performance of activities of daily living, which are evaluated in the present study, is one of the key conditions for the well-being of the elderly, even when the individual is frail or suffers from a chronic disease. An individual and social approach is required to create better living conditions in old age, characterized by autonomy and quality of life, as well as interventions for healthy aging, with accessible services focusing on the most vulnerable populations[28].

CONCLUSION

The present study found differences in the prevalence of elderly persons with arthritis or rheumatism based on gender and sociodemographic profile. Associations between functional disability in instrumental activities of daily living and sociodemographic variables and frailty were also identified. When dependence in activities of daily living based on presence of the disease was assessed, there was a difference between the groups in terms of use of medication.

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Challenges and technologies of care developed by caregivers of patients with Alzheimer's disease

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Abstract

Objective: to identify the challenges and technologies of care developed by caregivers of patients with Alzheimer's disease. *Method:* an exploratory study with a qualitative approach was carried out with nine caregivers of elderly people with Alzheimer's disease from the mutual help group of a university hospital in the south of Brazil. Data collection took place between May and August 2017 through a semi-structured interview. Content analysis was used to analyze the data. *Results:* two categories emerged from the analysis of the data: the challenges faced by caregivers of elderly people with Alzheimer's Disease and the care technologies developed by caregivers of elderly people with Alzheimer's disease. *Conclusion:* the study showed that the care strategies elaborated by the caregiver can enhance understanding, reflection and discussion among health professionals, caregivers and family members about quality care for the elderly and minimize the difficulties of care in order to provide greater quality of care for the elderly.

Keywords: Elderly. Alzheimer Disease. Caregivers. Aging.

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INTRODUCTION

Alzheimer's disease (AD) is the most common form of dementia in the elderly, accounting for 50% to 70% of cases. However, although one million people have this pathology in Brazil, there remains little data regarding its incidence in the country[1].

Due to its degenerative nature, the disease impairs the individual's ability to perform activities of daily living (ADL) and instrumental activities of daily living (IADL)[2]. Considering the progression of the disease, caring for elderly persons with AD presents diverse and complex challenges for caregivers[3].

When a family member cares for an elderly person with AD, the negative points of this role (anxiety, depression, among others) often become issues, along with the caregiver's own dissatisfaction[4]. Faced with these challenges, many caregivers use creativity and adopt and/or employ various technologies in order to improve and facilitate the care process, as they experience the pre-eminent need for the multiple adaptations that the disease brings with it.

Technology is understood here as a set of knowledge and actions applied to the production of something, which in the case of the study in question, are technologies for the production of care[5].

The present study therefore aimed to identify the challenges and technologies of care developed by caregivers of patients with Alzheimer's disease.

METHOD

An exploratory, qualitative study was carried out with caregivers of elderly people with AD who were participants of the Mutual Assistance Group (MAG) of the Brazilian Alzheimer's Association (ABRAZ) in Florianópolis, Santa Catarina, of the Hospital Universitário Professor Polydoro Ernani de São Thiago. The group is a non-profit association with the objective of disseminating knowledge about AD through the guidance of health professionals and the experiences of caregivers. The group involves activities that extend from the welcoming of new caregivers through discussion groups and informative meetings, with these activities intercalated on a weekly basis.

The group was chosen as a study scenario as it brings together a significant number of participants and also because it is where the interest for the research emerged from the questions and exchanges of experience among the participants regarding the care technologies they implemented.

The study population consisted of all the participants, family members and caregivers of elderly people with Alzheimer's who attended the MAG at the time of data collection and who met the inclusion criteria, which were: be a caregiver of an elderly person with Alzheimer's, aged over 18 years and attend or have attended the group in the last year, regardless of the number of meetings attended. The exclusion criteria were: live outside the Greater Florianópolis region, making home visits impossible. The caregivers were invited to participate on the days of the meetings of the group and by telephone contact. After acceptance, the meetings were held at a location chosen by the caregiver. Therefore, some were performed in the room where the group took place while others were carried out in the home. All the participants signed a Free and Informed Consent Form (FICF) and retained a copy of the same.

Data collection took place through semi-structured interviews between May and August 2017, conducted by a single interviewer who was not part of the mutual aid group. The questionnaire was composed of two stages, the first of which contained information about the profile of the elderly persons and the second which contained open questions regarding the specific daily care of the elderly including diet, hygiene and comfort and medication, among others. Nine caregivers participated. To guarantee their anonymity, the participants were identified with the codenames C1 to C9.

The data analysis followed the steps established by Content Analysis: pre-analysis from a skim reading and establishing of the corpus; exploration of the coded material from the dividing of the texts into register units; and treatment and interpretation of the results obtained through working with meanings of the data[6].

The information collected through interviews with the caregivers of elderly persons with AD was employed in the pre-analysis phase. This was

transcribed and analyzed qualitatively from an analytical perspective through the skim reading of the investigated material. The corpus for analysis was therefore obtained. In this process it was necessary to constantly return to the initial questions.

During the exploration of the coded material, the significant expressions from the interviews, upon which the contents of the speech were organized, were identified. In this way, the units of meaning (UM) where the key words, sentences and phrases were codified were extracted from the text. After the identification of the UM, through a counting process based on the codifications, the classification and aggregation of the data was performed. Theoretical synthesis categories were then created to specify the theme[6].

The treatment and interpretation of the results phase involved the condensing and highlighting of the information for analysis, culminating in inferential interpretations, at the moment of intuition, of the reflexive and critical analysis[6].

The study was approved by the Ethics Committee on Research Involving Human Beings of the Universidade Federal de Santa Catarina under number CAAE 65869817.4.0000.0121.

RESULTS

The participant caregivers were aged between 52 and 70 years with a mean of 61 years and their main characteristics are listed in Table 1.

Table 1. Characterization of participants (N=9). Florianópolis, Santa Catarina, 2017.

Categories	Characteristics	Characteristics
Family Caregiver (8)	Spouse (1)	Son/daughter (7)
Occupational Caregiver (1)	Professional training (-)	No professional training (1)
Gender of caregiver (9)	Female (8)	Male (1)

Two categories emerged from the analysis of the data: challenges faced by caregivers of elderly people with Alzheimer's Disease and care technologies developed by caregivers of elderly people with Alzheimer's disease.

Challenges faced by caregivers of elderly people with Alzheimer's disease

This category describes the difficulties of caregivers regarding the daily care of elderly people with AD in terms of ADL and IADL.

In relation to sleep and rest, difficulties were observed in maintaining regular and peaceful sleep, in addition to difficulties to either falling asleep or waking up early. In addition, it is common for the elderly to experience restlessness at dusk.

> "He didn't sleep for almost fifty hours. Sometimes he has bad turns... Then he talks all the time and I have to stay close to him. It's bad for him because he needs sleep and bad for the people who need to sleep too" (C9).

> "[...] it's worse from six o'clock in the evening she starts shouting, saying things, sometimes she's anxious, there's a despair inside her that I worry about, but I think it's her illness" (C4).

Regarding the care of hygiene and comfort, the caregivers reported that most of the elderly are resistant to bathing and have difficulties wearing the appropriate clothing for the seasons, mainly due to forgetting the stages of these procedures. In oral hygiene the greatest difficulty is closing the lips.

> "Bathing is terrible, bathing has always been the most complicated issue. She even gets up, takes medicine, drinks coffee, but she doesn't want to have a bath, she doesn't want to change her nightclothes, she doesn't want to. She curses me and beats me, she asks for help ... so imagine what it's like between us" (C7).

> "[...] She hasn't even brushed her teeth lately. She won't let me, she won't open her mouth! I'm scared she has caries, because how can we fix them?" (C6).

In care related to the intake of food and liquids, the caregivers emphasized the slowness of the process, the difficulties of chewing and/or swallowing and a trend towards a greater intake of sweet foods. It is also necessary to change the consistency of food, which needs to be liquefied.

> "She doesn't chew, so all the food has to be put in a blender [...]" (C2).

> "Sometimes we make beans and rice, meat and some vegetables, put it in the blender, it gets creamier and she eats it slowly. And when I say slowly I mean one hour. It takes an hour, and most of the time she doesn't eat savoury foods" (C5).

In terms of the cognitive disorders of the demented elderly, the caregivers emphasized: inability to perform IADL, recurrent loss of memory, awareness and, especially, value judgment.

> "The hardest part of it is the way she hides things. Sometimes the girl who comes to clean in the morning finds a cleaning product because we have to keep the products, the floor cloth, the broom, everything in my sister-in-law's closet in the other house because otherwise she hides them" (C8).

> "She doesn't interact anymore, I mean pain, thirst, heat, cold, anything. Her senses are gone. She does not talk either. She doesn't know me, she doesn't know her daughter. She just complains. I call her name, she looks and definitely thinks who is it, who is calling, in her subconscious. But I see that there is no way back" (C5).

Other important difficulties reported were difficulty in accepting and swallowing medications and aspects related to physical mobility.

> "She spits, keeps the tablet in her mouth, I have to watch to see if she's really swallowed it, it's a lot of work!" (C7).

> "She was lying on her side and I forgot to put the railing up and she fell. I do not know how she didn't hit her head. I turned her so she could rest and went inside to make food. I thought, my God I forgot my mother, and when I came back she was already on the floor. And she didn't move [...] she broke her femur" (C3).

The challenges faced by caregivers generate burden, meaning they eventually neglect their own self-care. In addition, the routine and demand for uninterrupted care associated with increased domestic activities generate physical and emotional exhaustion among caregivers.

> "Most of my life is spent here. I've got everything here, I've put a sewing table here so sometimes I feels like sewing, but mostly I don't. I live here in the bedroom, I just go out to do something inside, get something to eat [...]" (C3).

> "So that's why I left my family, I left everything there, I put my life in a drawer, I gave up university, and I came here to be with my dad" (C9).

Care technologies developed by caregivers of elderly people with Alzheimer's disease

This category addresses the main care technologies that were developed by caregivers of elderly people with AD, including: adaptation of the environment for the physical safety of the elderly; adaptations for care in relation to ADL and IADL; leisure activities.

Among the adaptations of furniture and/or equipment identified, the most notable were: installation of support bars in the bathroom and the home; installation of spring doors; use of "busy or unoccupied" toilet signs; automatic faucets in the bathroom; widening of doors; removal of glass shower cabinets in bathrooms; toilet adapter; change of mattress to reduce bed height; safety boards such as side railings of the bed and use of safety gates; inflatable mattress for prevention of skin lesions.

> "At first she locked herself in the bathroom. Then I put a spring on it, took out the latch, and then she couldn't get stuck. I put a spring to keep the door closed ... and I put a sign on the door saying it was either busy or unoccupied" (C5).

> "[...] they complained that we were wasting a lot of water. She left the tap on. I put on an automatic faucet. You press it, use it and it turns itself off [...]" (C5).

> "We made a handrail so she could get from the bedroom to the bathroom, she can hold it with her hand, the toilet has a higher support, it has a special seat. It is about 10 cm higher to make it easier for her to sit down and get up" (C6).

In relation to the specific adaptations for maintaining the safety of the elderly, there were reports of removing carpets in the home, shutting off gas in the kitchen, installation of non-slip floors, use of protective belts with patches of fabric for mechanical restraint. Kitchen, matches, alcohol gel and door keys were also put out of reach of the elderly persons.

> "After she started to mess with the oven and didn't know what she was doing I started to see that she lit the oven, and it exploded. This happened at home and so I started to close the kitchen door, turn off the gas, and not leave matches around [...]" (C7).

> "My neighbor gave me pieces of string, and I tied her to the wheelchair though I disguised it [...]. Because one day I was at the market and I saw she was almost on the floor, she didn't fall, but she was slipping off the chair" (C2).

Food-related adaptations mentioned include: liquefying food; use of bottles and/or straws to facilitate and/or speed up the feeding process.

> "She uses a baby's bottle because she can't chew [...] sometimes I even have to spoon feed her to stop her giving up" (C4).

Adaptations involved macerating in administering medicine involved macerating the tablets and combining them with food in order to make the elderly accept them.

> "She doesn't swallow the pills or she spits them out, and then I have to give her more medicine. So I crush it all. I put it in water to break it down, to make it liquid, sometimes I give it to her pure, sometimes I mix it with food, with yogurt, or a dessert..." (C4).

There were noteworthy adaptations relating to hygiene and comfort among the caregivers, including: the creation of a toilet at the side of the bed; a blackout curtain or plastic sheet used as a waterproof sheet; the use of a bath chair or heater.

> "She urinates in the toilet I made beside the bed" (C2).

> "She bathes in the shower, there's a little chair that has a hole in the middle. So we use a heater, let the room warm up and then she takes a shower sitting down [...]" (C5).

The use of a geriatric diaper combined with a baby diaper was described to increase the absorption of urine; as was the use of underwear under the geriatric diaper and the application of ointment together with essential fatty acid to prevent dermatitis.

> "I use a geriatric diaper with a baby diaper. I even used those big panty liners, but it was no use. I had to change the sheet every time as well because everything went through. It was terrible! Now I put it in in the morning and sometimes I only change the geriatric diaper at night. If not it's just the baby diaper. It's great!" (C3).

Leisure activities included: bingo, shopping trips and/or to beaches, watching television, listening to music, car rides, gardening and playing with dolls.

> "She likes music, we always put it on to listen to, but there are days when she's not interested, it depends on the day. There are days when she dances, claps, and we see she's following the sound" (C6).

> "[...]she started to ask the children. So I bought a doll' (C2).

The main technologies developed by the caregivers were: crossword games; jigsaw puzzles; clipping activities based on ADL and IADL; and the creation of games, including the association of image with writing and memory games.

> "I made all the games, I used the catalogs for most of them. There are two identical catalogs so that I can play the game of pairs, of memory [...]. I managed to get a lot of materials. And so I managed to make a puzzle game, the game of pairs [...]" (C8).

DISCUSSION

The profile of the interviewees is made up of family caregivers (n = 8), most of whom were caring for parents (n=7), female (n=9), similar to those found in literature[7].

Dementia has an important impact on the family, caregivers, society and the economy[8]. The findings of the present study show that these difficulties are, in large part, linked to the maintenance of the basic human needs of the elderly by the caregiver.

Sleep disorder was one of the most frequently observed behavioral disorders. Literature suggests that, in general terms, such a disorder is due to changes in neuronal activity, interfering in the balance of the sleep-wake cycle and a reduction in cholinergic activity. In addition, difficulties in comprehension experienced during the day influence the sleep of the elderly with AD[9]. The behavioral changes common to dusk are explained in the literature as "sunshine syndrome" or "sundowning", characterized by mental agitation and/or confusion during the day, which was confirmed by the statements[10].

The difficulty of the elderly person with AD in accepting hygiene and comfort care was also a challenge for caregivers. Studies indicate that due to memory impairment and learning and communication problems, elderly people with AD will inevitably exhibit difficulties in carrying out basic personal hygiene care.

Some research suggests that, in this condition, the responsibility of care is inextricably linked to the caregiver, making them responsible for the total or partial accomplishment or supervision of tasks, due to the complexity of the same being carried out by an elderly person with dementia[11].

Most caregivers reported difficulty in care involving eating, highlighting the need to alter food consistency to facilitate this process.

Similar to the findings of the present research, a study that aimed to assess the risk of dysphagia and its relationship to the stage of Alzheimer's disease found that as AD progresses, the risks for the development of dysphagia increase[12], which possibly explains the changes in the eating patterns of the elderly and even in the acceptance and administration of medications observed in the present study. It should be noted that this fact is related to the emergence of lingual motor dysfunction, delayed swallow reflex, reduced oral motor control and an inability to masticate, described in literature as frequent disorders in elderly persons with AD[12].

The inability to perform IADL, recurrent loss of memory, loss of sensation and loss of value judgment was also observed in the study population, as mentioned by caregivers. Researchers describe how the anchorage of the elderly in the memories of the past represents a phenomenon of support of identity and the preservation of self-consciousness. In addition, due to these aspects, impaired reasoning and judgment are also observed in the elderly with AD and represent nursing problems that can be dealt with[13].

Accordingly, care technologies constitute essential tools for maintaining/attempting to maintain cognition for as long as possible, with the aim of prolonging the social integration and attachment of the elderly[13].

Another challenge described by the caregivers was the reduction of balance, gait and, above all, mobility among the elderly with AD. Literature emphasizes that these are conditions observed in the evolution of AD, related to the occurrence of secondary outcomes such as a greater risk of falls[14].

In addition, because of burden, there are frequent signs of anxiety and depression among caregivers, resulting in physical and emotional exhaustion in various contexts. On such occasions it is essential to recognize the importance of a broad and multidisciplinary approach based on the needs of caregivers so that they do not neglect their own self-care[15].

Many technologies developed by the caregivers were related to adaptations of the home environment to maintain the physical safety of the elderly in order to preserve their functional capacity as much as possible, allowing them to perform ADL or certain tasks autonomously[16]. A caregiver can be one of the parties responsible for the publicizing and broadening of knowledge about the care of elderly persons with AD[17], emphasizing the daily necessities of those with Alzheimer's Disease.

This wide range of care technologies comprises a set of knowledge and actions applied to the production of something, which in the case of the study in question, are technologies for use in care[18]. Technologies can also be placed into categories such as hard technology, which corresponds to materials such as equipment and furniture; soft-hard technology, which includes knowledge related to the disciplines that work in the health area, such as dentistry, medical clinic, epidemiology, among others and soft technology, related to the production process of communication and human relations, among others[19].

In this context, the concept of technology can be considered as a result of processes arising from people's everyday experiences, for the development of a set of knowledges and strategies in an organized and articulated manner, for the elaboration, planning and execution of material and symbolic goods with a specific practical purpose[18], which in this case corresponds to the more efficient care of the elderly with AD.

The loss of hydration, oiliness and elasticity of the skin was also reported in this study, and occurs as a consequence of loss of mobility, increasing frailty and the ease of injury, one of which is pressure ulcers and/or skin tears - disruption of the skin mainly by friction and shearing[20]. For this, many caregivers use as alternative special paddings and wound coverings, such as a hydrocolloid dressing for the prevention and treatment of such skin lesions.

As for the care technologies developed for the hygiene and comfort of the elderly, caregivers used creativity to provide safety and well-being, mainly related to bladder and bowel movements, such as the development of a toilet adapted to the side of the bed, as depending on the phase of the disease the elderly person may be unable to remember their way to the bathroom, and even the use of geriatric diapers.

Urinary and intestinal incontinence is another common condition in elderly people with Alzheimer's as they lose the ability to recognize the need to go to the bathroom. However, incontinence may also be related to changes in the urinary tract during aging, even in the absence of dementia[21].

As for leisure activities, most caregivers reported using music, walking and the development of games that stimulate cognition. Studies have shown that leisure activities tend to improve performance in ADL in elderly persons with AD, as they trigger the activation of existing brain functions and delay cognitive decline by creating new connections between neurons.

Therefore, technology is associated with the way people live, and can be present in workplaces, homes and relationships, consisting of the human skills to build and use tools from an emerging need[18]. Health work cannot be expressed in structured technological equipment and knowledge, since its most strategic actions are in intervention processes, operating as technologies of relationships, encounters and subjectivities[22].

In this way, the study showed that aging with AD demands numerous challenges, requiring caregivers to constantly learn and develop skills and creativity to exercise quality care and develop both adaptations and care technologies. Limitations of this study include its regional nature and the limited number of participants.

CONCLUSION

The main care technologies found in this study were adaptations of the home environment aimed at the physical safety of the elderly with Alzheimer's disease, as well as the use of suitable mattresses and covers for the prevention of pressure ulcers, such as hydrocolloid dressings at the pressure points of elderly persons with Alzheimer's disease, and the use of resources such as music, walking and leisure to stimulate the cognition of such individuals.

The caregivers showed themselves to be a great supporters of the care given that it is they who spend most of their time with the elderly, as well as being responsible for assisting them in carrying out activities of daily living in order to preserve their autonomy as much as possible. It is believed that the care technologies identified in this study can help other caregivers in the process of caring for the elderly with Alzheimer's Disease.

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Drug therapy, potential interactions and iatrogenesis as factors related to frailty in the elderly

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Abstract

Objective: to investigate the use of drugs, potential drug interactions and iatrogenesis, as factors associated with frailty. *Method*: an observational, cross-sectional, population-based study of elderly persons registered with the Family Health Strategies of the urban area of a municipal region in the south of Brazil was carried out. The sample was probabilistic and involved 554 elderly persons; and the proportional stratified sampling technique by FHS and gender was used. Data collection was performed in the home, with the gathering of information regarding sociodemographic characteristics and pharmacotherapeutic profile and the evaluation of frailty based on Fried et al. (2001). *Results*: medications were taken by 86.3% of the elderly and there was a prevalence of frailty of 63.0%. A total of 39.4% of the elderly were exposed to polypharmacy, 49.1% used potentially inappropriate medications and 52.2% were exposed to potential drug interactions, the most frequent being enalapril and metformin. An association between increased risk of frailty and the variables: polypharmacy; use of potentially inappropriate medications; potential drug interactions; more than two potential drug interactions with the presence or absence of potentially inappropriate medication was identified. *Conclusion:* an association was found between frailty and polypharmacy, the use of potentially inappropriate medication and the presence of drug interactions. The findings underscore the importance of the monitoring of drug therapy in this population group with a view to the early detection, prevention and resolution of iatrogenesis arising from the use of medicines.

Keywords: Elderly. Frail Elderly. Pharmaceutical Preparations. Drug Interactions.

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INTRODUCTION

The aging process of individuals is related to changes in functional capacity, which can be impaired by the presence of chronic diseases and may trigger frailty. The elderly are therefore the age group with the highest prevalence of frailty[1–3].

One of the main risk factors of frailty among the elderly is the use of medications[1]. Around 70% to 90% of the elderly use at least one medication on a daily basis, with an average of two to five drugs prescribed per elderly person[4].

Although drugs contribute to greater quality of life and life expectancy, their use can generate negative impacts, such as the occurrence of unwanted drug interactions (DI). DIs can impair the efficacy and safety of the proposed treatment, highlighting the importance of this topic and the need to evaluate and monitor problems related to medications[5]. DIs are mainly related to polypharmacy and the use of potentially inappropriate medications (PIM) for the elderly, which can trigger and/or potentiate health problems and exacerbate the condition of frailty[2,6]. The greater the number of drugs used in the treatment of an individual, the greater the probability of the occurrence of iatrogenesis[7].

The elderly are more vulnerable to undesirable drug-related outcomes, mainly due to the physiological changes caused by senescence, as well as potential DIs, factors that can affect safety and increase patient morbidity and mortality, and which are directly associated with the clinical conditions of the patient[6]. In view of the above, the present study aimed to investigate the use of drugs, potential drug interactions and iatrogenesis as factors associated with frailty.

METHOD

A cross-sectional, analytical, population-based study was conducted from April to November 2015 in a medium-sized municipal region in the northwest region of the state of Rio Grande do Sul, Brazil. The study population consisted of elderly individuals aged 60 and over, of both genders, assigned to twelve Family Health Strategy (FHS) units in the urban area of the municipal region.

For the sample calculation, the data of the Basic Care Information System (BCIS) was used; the total number of elderly persons enrolled in the FHS in the urban area was 5,269; of this total 2203 (41.8%) were male and 3056 (57.9%) female. A rate of over 10% was chosen to represent the elderly population of the FHS. An initial sample of 738 elderly subjects was chosen. It was elected not to use replacements and it was considered that losses of up to 30.0% would not prejudice the validity of the data. The final sample size for the study was 554 elderly people accounting for 10.53% of the study population. To achieve greater representation, stratified proportional sampling was used; each ESF was considered a stratum; and men and women were selected proportionally using a simple drawing of lots technique from the list of the elderly persons provided by each unit.

The data of the present study were collected through home-based interviews, using a research instrument composed of a sociodemographic profile questionnaire (age, gender, marital status, education and income) and a modified Dáder Method questionnaire[8], to characterize the pharmacotherapeutic profile.

The interviews were conducted by five researchers, including the proponents of the study and undergraduates in the area of health, all of whom were previously trained. To identify team qualification and the integrality of the application of the instruments, a pilot test was performed with 30 subjects, who were included in the study population.

The first, second and fifth levels of the Anatomical Therapeutic Chemical Index[9] (ATC) were used to classify the medications used. For the identification of PIM, the Beers criteria, updated by the American Geriatrics Society, was used[10].

Potential drug interactions were analyzed and classified in terms of severity using the Micromedex Health Series database[11]. Severity was classified as: a) *severe* – may be life-threatening and/or require intervention to reduce or avoid serious adverse effects; b) *moderate* – may result in exacerbation of the health problem and/or require a change in treatment; e c) *mild* – the interaction would have a limited clinical effect and a major change in treatment is not required. Because of their low risk, interactions of mild severity were not computed in this study.

The potential effects generated by the interactions were classified in accordance with the first level of the ATC[9], and the evaluation of the systems and pharmacological class affected by the interaction.

Frailty was evaluated and classified according to the criteria proposed by Fried et al[12]: a) Unintentional weight loss in the last year, evaluated by self-report; b) Fatigue evaluated by two self-reported items taken from the Center for Epidemiological Studies Depression (CES-D) Depression Scale validated for application in elderly individuals by Batistoni et al.[13]; c) Hand grip strength, evaluated by an E-Clear EH101 dynamometer; d) Gait speed, which indicates the time, in seconds, that each elderly person takes to walk, at their usual pace, a distance of 4.6 meters; e) Physical activity level, evaluated by means of self-reporting of the weekly frequency and duration of physical exercises and active sport and domestic activities carried out in the week prior to the interview. Individuals with the presence of three to five criteria are considered frail; those with the presence of one or two criteria pre-frail; and those with the absence of criteria pre-frail. For the purposes of statistical analysis, the elderly were allocated into two groups: non-frail elderly; and frail elderly individuals, which included the pre-frail.

A descriptive analysis of the data was initially performed, according to the qualitative and quantitative nature of the variable. To verify the association between frailty and: the number of medications used; the use of PIM and the presence of PIM; potential DI; the Pearson Chi-square hypothesis test was used and risk was calculated using the Odds Ratio (OR). The Statistical Package for the Social Sciences (SPSS) was used to analyze the data. A 5% level of significance was considered for all the tests.

The present study was designed in accordance with the Regulatory Directives and Guidelines on Research Involving Human Beings in accordance with National Health Council regulation n°. 466/2012 and was approved by the Ethics Research Committee of the Universidade Regional do Noroeste do Estado do Rio Grande do Sul under n° 1.117.162/2015 and CAAE: 43893915.0.0000.5350.

RESULTS

The mean age of the elderly in the study was 71.14 (± 8.28) years (95% CI: 70.45-71.83), with a minimum age of 60 years and a maximum of 102 years. The majority of the elderly persons were female, married and with an incomplete elementary education. The sociodemographic characterization is shown in Table 1.

The prevalence of frailty in the study population was 63.0%. In relation to the use of drugs, 86.3% (n=478/554) of the elderly used medication, with a mean of 3.95 (± 3.77) (95% CI, 3.7-4.21) drugs per elderly person; (n=218/554) were exposed to polypharmacy, of which 73.9% (n=161/218) were classified as frail; while 49.1% (n=272/554) of the elderly took potentially inappropriate medication, of whom 69.9% (n=190/272) were classified as frail elderly persons. These data are set forth in Table 2.

Table 1. Sociodemographic characteristics of elderly persons registered with the Family Health Strategies of the urban area of the municipal region of Ijuí, Rio Grande do Sul, 2017. (N=554).

Categories	Total	%
Gender		
Female	337	60.8
Male	217	39.0
Marital status		
Married	326	58.8
Widowed	141	25.5
Single	29	5.2
Divorced	29	5.2
Civil Union	29	5.2

to be continued

Continuation of Table 1

Categories	Total	%
Years of schooling		
0	60	10.8
Up to 8	416	75.1
8-11	57)	10.1
> 11	21	3.8
Household Arrangements		
Spouse	351	63.4
Children	88	15.9
Alone	79	14.3
With other relatives	18	3.2
Non-family members	12	2.2
Grandchildren / Great grandchildren	6	1.1
Family income		
1 to 3 MW*	370	66.8
3.1 to 5.0 MW	92	16.6
<1.1 MW	64	11.6
5.1 to 10 MW	19	3.4
>10 MW	9	1.6

*MW: minimum wage. 1 MW equivalent to R$ 788.00 (2015).

Table 2. Relative and absolute frequencies of variables related to medications and association with frailty. (N=554). Ijuí, RS, 2017.

Variable	Non-frail elderly %(n)	Frail elderly %(n)	p	OR (CI95%)
Use of medications				
Use	35,8 (171)	64,2 (307)	0,13	1,45 (0,89-2,37)
Don't use	44,7(34)	55,3 (42)		
Quantity of medications				
< 5	44,0 (148)	56,0 (188)	0,00	2,24 (1,53-3,22)
≥ 5	26,1 (57)	73,9 (161)		
PIM**				
Don't use	43,6 (123)	56,4 (159)	0,00	0,55 (0,39 -0,79)
Use	30,1 (82)	69,9 (190)		
DI*				
No DI (=0)	42,6 (113)	57,4 (152)	0,00	1,59 (1,12-2,25)
≥ 1 DI	31,8 (92)	68,2 (197)		
DI with presence of PIM				
≤ 2 interactions	33,6 (74)	66,4 (146)	0,01	2,78 (1,24-6,22)
> 2 interactions	15,4 (8)	84,6 (44)		

*Drug Interaction; **Potentially inappropriate medication for the elderly.

An association between polypharmacy and frailty was identified. The risk of frailty was twice as high among those who used more than five drugs. An association was also observed between the use of potentially inappropriate medications and frailty.

In terms of potential DI, an average of 1.75 (±2.82) interactions per subject was identified, while 52.2% (n = 289/554) of the elderly had a risk of DI. Of these, 68.2% (n=197/289) were from the frail elderly group, with an association between susceptibility to

potential DI and frailty; the OR showed that elderly persons subject to drug interactions had a 52.0% greater chance of frailty.

We also analyzed potential DI with the presence of PIM. It was found that 19.1% (n=52/554) of the elderly experienced more than two interactions involving PIM; of these 84.6% (n=44/52) were frail; with a statistically significant difference between frailty and being subject to DI with PIM. The OR shows that there was an almost three times greater chance of frailty among users with more than two DIs involving PIM.

It was observed that of the 289 elderly individuals exposed to potential DI, 77.1% (n=101/289) had one to two DI and were frail. An association was also observed between the number of MIs and frailty (p <0.01) and the chances of frailty were twice as great among the elderly with more than two interactions (OR = 2.17, 95% CI, 1.29-3.64).

Table 3 evaluates the elderly classified as frail, and shows the DI among the most frequent PIM identified among them. In the frail elderly, there was a higher frequency of: Enalapril x Metformin; Acetyl Salicylic Acid (ASA) x Enalapril; and Hydrochlorothiazide (HCTZ) x ASA. However, a statistically significant association was only identified between frailty and the potential interaction between Calcium x HCTZ, among frail elderly persons.

In contrast, when observing the association between frail elderly persons with DI including PIM, a statistically significant association was observed with the drugs Digoxin x Omeprazole.

Table 3 shows that the cardiovascular system is the most affected by potential DI, most frequently with moderate and/or severe severity; while the blood system was the most affected by PIM, with a predominance of severe interactions.

Table 3. Drug Interactions and Potentially Inappropriate Medications Associated with Frail Elderly Persons registered with the ESF in the municipal region of Ijuí, Rio Grande do Sul, 2017. (N = 554).

Interactions	Severity	Outcome	System Affected (ATC*)	Prevalence of interactions % (n)	p	OR** (CI95%)
Enalapril X Metformin	Moderate	Increased risk of hypoglycemia	Metabolic and Digestive and Nervous	8.8 (49)	0.11	0.58 (0.30-1.13)
AAS*** X Enalapril	Moderate	Decreased efficacy of Antihypertensive	Cardiovascular	8.8 (49)	0.50	0.81 (0.43-1.51)
HCTZ**** X AAS	Severe	Decreased Efficacy of Diuretic and Possible Nephrotoxicity	Cardiovascular and Genitourinary	8.1 (45)	0.13	0.59 (0.30-1.18)
Enalapril X Furosemide	Moderate	Postural Hypotension	Cardiovascular	2.2 (16)	0.12	0.38 (0.10-1.36)
Calcium X HCTZ	Moderate	Increased risk of hypercalcemia	Cardiovascular. Metabolic and Digestive	2.3 (13)	0.02	0.13 (0.01-1.06)
Potentially Inappropriate Medication						
Digoxin X Omeprazole	Moderate	Digital Toxicity	Cardiovascular. Metabolic and Digestive	1.6 (9)	0.02	1.60 (1.50-1.71)
Amitriptyline X Ibuprofen	Severe	Increased risk of bleeding	Blood	0.9 (5)	0.42	0.42 (0.04-3.80)
Alprazolam X Omeprazole	Moderate	Benzodiazepine toxicity	Nervous	0.5 (3)	0.89	0.85 (0.07-9.43)
Diclofenac X Ibuprofen	Severe	Risk of hemorrhage	Blood	0.6 (2)	0.27	1.59 (1.49-1.69)

*Anatomical Therapeutic Chemical Index; ** Odds Ratio; *** Acetylsalicylic acid; **** Hydrochlorothiazide.

Table 4 shows the association between the systems most affected by potential interactions and frailty. There was no statistically significant association between the affected systems and frailty.

Table 4. Association between systems affected by potential drug interactions and frailty of elderly people registered with FHS. Ijuí, Rio Grande do Sul, 2017. (N=554).

Variable	Non-frail Elderly % (n)	Frail Elderly % (n)	p	OR* (CI95%)
Cardiac System				
Yes	39.1 (79)	60.9 (123)	0.35	1.28 (0.75-2.17)
No	33.3 (29)	66.7 (58)		
Nervous System				
Yes	42.7 (44)	57.3 (59)	0.16	1.42 (0.86-2.33)
No	34.4 (64)	65.6 (122)		
Metabolic and Digestive System				
Yes	37.2 (54)	62.8 (91)	0.96	0.98 (0.61-1.59)
No	37.5 (54)	62.5 (90)		
Blood System				
Yes	28.3 (17)	71.7 (43)	0.10	0.6 (0.32-1.11)
No	39.7 (91)	60.3 (138)		
Genitourinary System				
Yes	45.2 (28)	54.8 (34)	0.15	1.51 (0.85-2.67)
No	35.2 (80)	64.8 (147)		
Musculoskeletal System				
Yes	30 (12)	70 (28)	0.29	0.68 (0.33-1.40)
No	38.6 (96)	61.4 (153)		

* Odds Ratio

DISCUSSION

The prevalence of frail elderly in this study was 63%, whereas in the Frailty among the Brazilian Elderly (FIBRA)[3] study it was around 60%. Pegorari and Tavares[2] identified that 68.2% of the elderly studied had at least one criterion that determining frailty, with 12.8% frail and 55.4% pre-frail. Buranelo et al.[1] found that 11.1% of the elderly were frail and 46.3% were pre-frail, accounting for 57.4% of individuals.

The results of the present study demonstrate the significant consumption of drugs by the elderly, which is an important factor in relation to frailty. Also related to this condition is the use of polypharmacy and the presence of PIM. The association between frailty and polypharmacy has been demonstrated in other studies [2,14–17], as has the association with PIM[16,18]. A relationship between frailty and polypharmacy was found in the present study, agreeing with other studies that used the same methodology to establish the frailty phenotype[14,16]

Aging predisposes the individual to an increased risk of adverse health events. Elderly patients with a higher number of associated diseases may require more medication, as evidenced in another study[17]. The chance of being frail as opposed to robust was significantly higher in elderly persons with cognitive decline, postural instability and who were subject to polypharmacy. This same study found a three times greater risk among elderly people subject to polypharmacy. It is understood that in the process of becoming frail the clinical, physical and cognitive conditions are related to an increase in the use of medicines.

An association between the use of PIM and frailty was also revealed by the results of the present study. Similar results have been found in literature [16,18]. In clinical application, PIM can aggravate the clinical picture of the elderly, affect quality of life; and increase the risk of potentially serious and fatal events[10].

The presence of PIM, as well as the high number of drugs used in pharmacological treatment, tend to

leave frail elderly individuals prone to negative events, such as an increased risk of adverse effects, mostly from DI. In this context, the present study found that the prevalence of frailty was greater when PIM were used in potential DI. These relationships can be explained by the changes and characteristics present in frail elderly people that make them more vulnerable to manifestations of DI and health problems resulting from the same[6,15]. It should also be pointed out that the cross-sectional design of the present study makes the establishing of a causal relationship with the outcome of DI among the elderly impossible.

The metabolism of drugs is slower during senescence, which results in the greater concentration and action of the drug in the body due to the decrease in hepatic and renal clearance and a reduction in blood flow; which results in the low extraction rate for the drug[19]. In addition to metabolization, the diminished capacity of the homeostatic reserve of the body can cause a decline in functions and increase the sensitivity of some drugs; which increases the exposure time of the drug in the body and thus increases the risk of DI[20].

Potential DI arising from the pharmacodynamic and pharmacokinetic modifications of drugs in the elderly body together with the use of a combination of several drugs have been widely explored in literature[21]. However, most of these studies do not consider frailty to be a factor associated with potential drug interactions. In this context, the integrative review by Rodrigues and Oliveira[21] on the occurrence of drug interactions and adverse drug reactions specifically among the elderly found that none of the 49 studies analyzed evaluated the frailty phenotype as an associated variable, although the interactions were related to frail conditions such as reduced functional capacity, falls, chronic diseases and geriatric syndromes.

When the specific DI associated with frailty in the elderly in this study is observed, it is highlighted that the most frequent potential DI was between Enalapril and Metformin, the outcome of which is an increased risk of the occurrence of hypoglycemia[11], with the potential to decompensate the metabolism of the elderly, especially among those considered frail, due to their low capacity for dealing with stressors[22]. Very low levels of glucose and cardiovascular complications in the body can trigger problems related to the cardiovascular system and central nervous system, such as: risk of acute myocardial infarction, strokes and syncope vagal vessel[22].

In addition to these effects, DI between Enalapril and Metformin may cause reduced strength, decreased walking time and changes in body balance, such as dizziness and consequently falls[22,23]. The study by Marcum et al.[23] found that falls were a result of negative events involving angiotensin converting enzyme (ACE) inhibitors. As well as leading to possible physical frailty, falls are related to psychological problems, such as depression and isolation. It is suggested, therefore, that these can function as a triggering event, precipitating the cycle of frailty. Furthermore, when occurring in an already frail body, the iatrogenesis triggered can be correlated with frailty, as a cause and effect, which can be avoided with proper management of the use of the medicines in question.

The interaction between Angiotensin Converting Enzyme Inhibitors (Enalapril) and oral antidiabetic agents (Metformin) had no statistically significant association with frailty in this study, but its frequency of occurrence among frail elderly patients should be considered, along with the iatrogenic complications of the same.

However, the drug interaction between Calcium and HCTZ, the outcome of which hypercalcemia[11], had a statistically significant relationship with frailty. Elderly patients, especially the most debilitated, are more prone to the symptoms of drug interactions, which include anorexia, muscle weakness, disorientation and progressive lethargy[24]. Such characteristics associated with frailty can influence and have serious consequences for the clinical picture of the elderly, intensifying the aggravation of the process. Unintentional weight loss due to anorexia and the reduction of strength has a causal relationship with the indication of frailty.

The interaction involving drugs considered inappropriate for elderly people and used most frequently and which had an association with frailty was between Digoxin and Omeprazole. This interaction predisposes the body to increase the absorption of digoxin as a consequence of the increase of the gastric pH, followed by a decrease in the hydrolysis of the digoxin, and alterations in its metabolism that when combined with the

reduced renal clearance of the elderly results in an outcome of digitalis toxicity[11,25]. As it has a narrow therapeutic index; and when dealing with frail elderly persons, the interaction involving digoxin may be potentially significant.

Symptoms of digoxin poisoning are often confused with other diseases, making its diagnosis difficult and delayed. In the frail elderly there may be an increased risk related to health complications, infections and disabilities, demonstrating the need for patient monitoring when using digoxin

While the most common potential specific interactions among frail elderly persons affect several organic systems, the cardiovascular system is most frequently affected by negative events due to potential interactions in the context of such individuals. Another study has already found similar results[26] without considering the phenotype of frailty.

Moreover, it is important to highlight that of the nine most frequent drug interactions found in the present study, six involved drugs classified by ATC as cardiovascular, agreeing with the findings of Somers et al[27]. The high frequency of coronary diseases and hypertension among the elderly[28] can explain the use of this medication class and consequently the greater risk of negative outcomes and interactions related to the cardiac system.

It is therefore important to identify the medications, their impact and the risk of interactions in the context of frailty in order to promote health care among the elderly. However, the design of the present study did not allow the monitoring and evaluation of the variables studied in the health of the elderly and the possible impacts of the drug treatment. However, these data highlight the importance of pharmaceutical care on a continuous basis and with systematic evaluations that can allow the early identification of the adverse effects of medications and their impact on the health of the elderly; and thus prevent the complications that arise from iatrogenesis and their impacts on the physical, functional and cognitive capacities that can intervene in the process of becoming frail.

CONCLUSION

In summary, there was a high consumption of medications by the elderly involved in the study, as well as the use of polypharmacy and potentially inappropriate drugs and the association of these with frailty.

It is important to consider not only the use of medications, but also the events resulting from drug therapy and its negative outcomes, as cause and effect related factors in the health-disease process of the elderly, especially those debilitated by the susceptibility presented.

Further studies regarding the risks/benefits of the treatment used by the elderly and their relationship with the frailty syndrome are suggested, in order to better define criteria that may help health professionals involved in continuous care and facilitate systematic evaluations that allow the early identification of adverse drug events and impacts on the health of the elderly; and thus prevent the complications arising from iatrogenesis and their impacts on the physical, functional and cognitive capacities that can intervene in the process of becoming frail among the elderly.

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The effect of the Contemporary Pilates method on physical fitness, cognition and promotion of quality of life among the elderly

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Abstract

Objective: to evaluate the effects of the Contemporary Pilates method on the physical fitness, cognition and quality of life of the elderly. *Method:* the Senior Fitness Test battery, the Vienna Test System and the EUROHIS QOL-8 quality of life questionnaire were used. The study group consisted of 16 elderly people and 27 classes of the Solo Contemporary Pilates method, held twice a week. To verify the normality of the data the Shapiro-Wilk test was used while the physical fitness and cognition variables were tested using the t-test for paired samples. Percentage analysis was performed for the quality of life variable and its dimensions. A significance level of 5% was adopted. *Results:* a significant difference (p <0.05) was observed in the variables: lower and upper extremity flexibility test (p=0.007), agility (p=0.001) and dynamic balance (p=0.001), aerobic endurance test (p=0.001) and Attention and Concentration test time (p=0.047). *Conclusion:* the Contemporary Pilates Method can improve the quality of life, physical fitness and reaction time of the elderly. It can be concluded that the Contemporary Pilates Method improves the health of the elderly, thereby helping to promote quality of life.

Keywords: Aging. Physical Fitness. Pilates Training. Cognition.

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INTRODUCTION

The aging process can be conceptualized as a dynamic and progressive phase in which morphological, functional and biochemical changes progressively limit the elderly. Studies show that in the long term sedentarism intensifies the processes of incapacity and dependence, as well as increasing the risk of the incidence of chronic diseases and cognitive and motor impairments[1-3]. Thus, the aging process is accompanied by changes in the neuromuscular, somatosensory, vestibular and visual systems and may be associated with a sedentary lifestyle or diseases, resulting in a functional capacity deficit[4].

In this sense, the practice of regular physical exercise tends to reduce the effects of aging on physical and motor capacity and consequently on quality of life. There are different types of physical exercises that can assist health promotion, such as water aerobics and floor gymnastics[5-7]. Among the physical exercises that bring benefits is the Pilates Method (PM).

PM includes resistance work based on the principles of breathing, control, concentration, precision, fluidity and centralization, thus integrating body and mind, helping to maintain health and physical abilities[8]. It is an exercise program that aims to minimize and reverse the negative effects of aging, improving levels of physical fitness, cognition and respiratory function, as well as being a physical conditioning method that integrates body and mind, attenuates muscle pain, improves movement range, increases control, strength, muscle balance and body awareness. It works the body as a whole, corrects posture and realigns the muscles, developing the body stability necessary for a healthier and longer life[9,10].

Given the above, the importance of maintaining functional capacity, postural stability and cognitive function for the general health of the elderly based on increasing life expectancy and changes in habits, can clearly be seen. The objective of the present study was to assess the effects of PM on physical fitness, cognition and quality of life (QoL) among a group of elderly persons.

METHOD

This study is characterized as a cross-sectional intervention type with pre- and post tests[11]. The study group was intentionally selected, and individuals were invited to participate in the research through social media, announcements in newspapers and community groups in the city of Santa Maria, Rio Grande do Sul. Elderly persons of both genders were recruited. Selection was based on the following inclusion criteria: being 60 years of age or older, not practicing regular physical exercise, being able to attend PM classes twice a week and having cognitive function preserved, verified through the Mini Mental State Exam (MMSE) [12]. The exclusion criteria were neurological, cardiovascular, respiratory and/or orthopedic diseases that impeded the performance of the exercises and a class attendance frequency of below 75%.

Twenty-seven classes using the Solo Contemporary Pilates Method were held. The tests were performed before the first class, characterized as pre-tests, and in the week after the last class, characterized as post-tests. All were performed by the same four previously trained evaluators.

The tests used were the Senior Fitness Test (SFT) which measures the physical fitness of the elderly. This battery is composed of six motor tests that assess the strength of the upper (forearm flexion) and lower (get up from and sit down in the chair) limbs, flexibility of the upper (reach behind the back) and lower (sit down and reach) limbs, agility/dynamic balance (sitting, walking 2.44 m and sitting down again) and aerobic endurance (walking for 6 minutes or standing gait) according to age group, validated for the Brazilian population by Mazo et al.[13].

In addition, the relationship between attention/concentration and the ability to react quickly to a stimulus was tested. Attention and Concentration Tests and Reaction Time with auditory and visual stimulus were evaluated using the Vienna Test System (VTS)[14] software and with the MMSE[12]. Pre and post-practice of PM quality of life was also evaluated. The collection instrument was the EUROHIS QOL-815 questionnaire, validated and translated, which measures QoL in the elderly.

The PM classes, representing the intervention, took place from April to July of 2017 in the Sport and Physical Education Center of the Universidade Federal de Santa Maria. They were taught by three physiotherapists certified in the Pilates method, accompanied by an undergraduate student in Physical Education as a monitor. The activities occurred twice a week (60 minutes) for 15 weeks, and the time of execution of each exercise was based on breathing time. The exercises used in the classes were the Solo Contemporary Pilates method, which consists of exercises performed on the ground, usually on mats and tatamis, requiring body awareness, strength, stretching and balance.

The set of exercises were: *bridge, spine stretch forward, saw, single leg circles, the hundred, the cat stretch, abdominal curls, mermaid, swan, side kicks forwards and back, side kicks up and down, swimming, and the spine twist*. Accessories (ball and elastic) were used and the exercises were based on the use of the individual's own body weight. The application occurred progressively and with the evolution of exercises from the least to the most difficult, for all participants, respecting the levels of physical fitness of each individual.

In addition, during the classes the elderly were dynamically stimulated to participate in the planning of the classes, in a dialogical process of teaching and learning, preserving their autonomy and proactivity. The elderly were stimulated through verbal and visual information to work with the principles of breathing, control, concentration, precision, fluidity and centralization, thus integrating body and mind. They were also encouraged to become aware of posture, strength, endurance, flexibility and balance, helping to maintain health and physical fitness.

The study was submitted to and approved by the Ethics Research Committee of the Universidade Federal de Santa Maria (CAAE: 45429015400005346) in accordance with Resolution 466/12 and Resolution nº 510/2016 of the National Health Council. All the participants read and signed a Free and Informed Consent Form (FICF).

Data were submitted to descriptive analysis. The normality of the data was verified through the Shapiro Wilk test, which identified that data distribution was normal. The variables of the physical fitness and cognition of the group were compared through the t-test for paired samples. The quality of life variable and its dimensions was assessed through percentage analysis. SPSS version 22.0 was used with a probability of significance value of 5%.

RESULTS

The present study initially consisted of 20 elderly persons, although there were 13 drop-outs (one man and 12 women) during the course of the project. Table 1 below shows the descriptive data of the group.

Table 1. Characterization of Sample. Santa Maria, Rio Grande do Sul, 2017.

Variables	n (%)	Mean (± sd)
Age		71.0 (±7.2)
BMI*		29.7(±13.1)
MMSE**		29.5(±2.0)
Marital Status		
Single	2 (15.4)	
Married	5 (38.5)	
Widowed	3 (23.1)	
Divorced	3 (23.1)	
Gender		
Women	12 (92.3)	
Men	1 (7.6)	

* Body mass index; **Mini mental state exam;

A significant difference (p<0.05) was observed for the variables: upper and lower limb flexibility test, agility and dynamic balance, and aerobic endurance test, thus confirming an improvement in physical fitness (Table 2).

There was only a significant difference in the mean time in the Attention and Concentration test. There were no significant differences (p<0.05) in the other cognitive variables (Table 3).

Table 2. Comparison between physical fitness variables (pre- and post-test). Santa Maria, Rio Grande do Sul, 2017.

Variables	Pre (Mean ± sd)	Post (Mean ± sd)	*P*
Elbow Flexion	14.85 (3.21)	17.31 (2.87)	0.081
Sit and Lift	9.15 (1.17)	12.77 (2.86)	0.001
FLX MMII (cm)	-10.952 (12.07)	-0.08 (8.65)	0.007
FLX MMSS (cm)	-20.12 (12.15)	-10.19 (10.93)	0.001
TUG (s)	8.091 (1.12)	6.45 (0.79)	0.001
6MWT (m)	437.36 (41.95)	479.85 (45.85)	0.001

Table 3. Comparative Analysis of Cognitive Variables through VTS (pre- and post-test). Santa Maria, Rio Grande do Sul, 2017.

Variables	Pre [Mean ± (sd)]	Post [Mean (± sd)]	*P*
Cognition Scores	47.5 (2.33)	47.5 (2.29)	1.01
Mean Cog Time	2.19 (0.6)	1.65 (0.5)	0.047
Auditory Reaction Time	3.3 (4.9)	4.33 (6.6)	0.520
Visual Reaction Time	2.7 (4.4)	25.6 (4.5)	0.094

There was a significant improvement in QoL, with 30.7% of the elderly considered their QoL to be very good before the exercise period and 92.3% after the exercise period. The satisfaction of the elderly with regard to health also increased, from 23.0% to 30.7%. Willingness to perform day-to-day tasks increased from 7.6% to 30.7%. There was also an improvement in the elderly persons' satisfaction with themselves, from 38.4% to 46.1%.

DISCUSSION

Improvements were mainly observed in the parameters of lower and upper limb flexibility, agility and dynamic balance, the aerobic endurance test and quality of life.

The decline of flexibility in the elderly is often due to lack of movement and a sedentary lifestyle[16], which occurs concomitantly with a physiological reduction in the elastic fibers[17]. In addition, flexibility is directly associated with joint mobility and muscle elasticity[18] and may be related to the autonomy of the elderly[19]. Fourie et al.[20] state that flexibility is directly linked to the independence of the elderly, as it is an extremely important component for movement. Also, adequate levels of flexibility are determinant for the successful execution of activities of daily living[21]. From this perspective, at the end of the intervention with PM, the participants of this study reported an improvement in their activities due to this mobility.

It should be highlighted that maintaining or gaining flexibility and muscle strength is an important goal in the health control of the elderly, directly influencing their QoL, as it can lead to the avoidance of comorbidities associated with aging[22].

We also prioritized the work of strengthening the abdominal region to obtain better functionality

of the spine and promote body control and balance. Corroborating the findings of the present study, the systematic review by Granacher, Gollhfer and Hotobágyi[23], concluded that strengthening the center of the body through intervention with PM contributes to efficiency in the extremities of the body by improving balance among the elderly. In addition, a study carried out by Hyun et al.[24] compared the effects of Pilates on the balance and stability of the torso of the elderly and found that the oscillation time of the body reduced, improving overall balance. Furthermore, the study by Pata et al.[25] aimed to determine if an exercise program based on PM was effective in improving dynamic balance, mobility, and postural stability, and found significant results in the Timed-Up and Go, Turn-180 and Forward Reach Test. Thus, studies suggest that a program based on PM can effectively improve balance, mobility, postural stability and reduce the number of falls.

Regarding cognition, which was also evaluated in the present study, a significant difference was observed only in the Attention and Concentration test response time, although there were also positive effects on the other means. An average Reaction Time of 330m was observed, with Reaction Time values of between 340m and 380m considered satisfactory for those aged over 60 years[21]. In addition, a positive correlation (0.729) was observed between the Reaction Time and the mean number of correct answers in the Attention and Concentration test. However, there was no significant difference in the results after the intervention.

It is observed that a strategy involving PM twice a week alone is not enough to achieve expressive cognitive improvements, but rather daily challenges and maneuvers, using cognitive aspects, knowledge construction, the constant learning of different elements, associations and interpersonal relationships, are required. In this context a study carried out by Middleton and Yaffe[26] postulates that physical exercise is one of the most promising strategies in the fight against dementia and that the improvement in physical fitness also brings cognitive benefits as the elderly become more independent and socially active. In addition, it is perceived that a greater frequency of stimuli leads to better results[27,28].

Faria et al.[29] report that one option for minimizing the loss of muscular strength is the practice of regular physical exercise, which allows the improvement or maintenance of the autonomy of the elderly and their social insertion, and also influences QoL. In the same way, Mazo et al.[30] emphasize that an effective exercise program for the elderly population should offer significant improvements in physical ability and fitness, such as cardiovascular endurance, strength, flexibility and balance, which will consequently provide greater personal autonomy and quality of life to these individuals. PM is an exercise program that offers these types of benefits to the elderly population, with the study by Jesus et al.[31] emphasizing that the method is both a physical exercise and leisure activity, bringing improvements to QoL, corroborating the findings of this study.

In view of these results, it can be seen that Pilates provides improvement in the physical fitness of the elderly and consequently in QoL. However, it is important to highlight some limitations found in the study, such as the low number of participants, most of whom were female, and the absence of a control group. Clinical trials, which assess the effects of PM with greater reliability, are therefore recommended.

CONCLUSION

It was identified that the practice of the Pilates Method promoted improvement in levels of flexibility, agility, dynamic balance and aerobic endurance. In addition, improvement in reaction time and quality of life was also verified.

Although there remain few studies on the Pilates Method in aging, with no consensus among the same, there are indications that the method has positive effects on several aspects, notably the improvement of physical fitness and quality of life.

Thus, the Pilates Method is an effective preventive strategy to maintain and improve health status, demonstrating direct and indirect beneficial effects on several aspects and contributing to the prevention of diseases and other comorbidities associated with changes caused by the aging process.

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Instruments for the functional assessment of elderly persons in palliative care: an integrative review

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Abstract

Objective: to identify validated instruments that can be used for the functional assessment of elderly persons in Palliative Care. *Method:* an integrative review focused on identifying instruments for the functional assessment of elderly persons in palliative care was carried out by searching publications in periodicals indexed in seven electronic databases. Descriptors, keywords and Boolean operators were used for a cross-database search in November 2017. A total of 357 abstracts were identified, from which 53 articles were selected for reading, of which 21 met the inclusion criteria. *Results:* this strategy allowed the identification of eight scales and one test for the functional assessment of elderly persons in palliative care. *Conclusion*: eight scales and a functional test which also provide guidelines for improving the quality of life of elderly people in palliative care were identified, demonstrating that it is practically impossible to disassociate physical functional performance from social and psychological aspects.

Keywords: Elderly. Palliative Care. Assessment Instruments.

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INTRODUCTION

As life expectancy increases, resulting in an ever increasing number of people aged over 60 and who live to an advanced age, disease patterns in the final years of life also change, with more people dying from the effects of chronic than acute diseases. The chronification of a disease carries the risk of incapacitating sequelae, which can make the patient highly dependent in activities of daily living. There is no curative treatment for such diseases, but there are methods of control[1].

Due to such disorders, focusing on palliative care has become not only a matter of public health, but also of the humanization of care. Palliative Care focuses on improving the symptoms and quality of life (QoL) of people approaching the end of their lives, as well as providing support for their friends and family. It questions "technolatry" and major investment in technology for patients with no possibility of a cure, resulting in reflections on the necessary balance between science and humanism in the face of human mortality, in order to salvage the dignity of life[2,3].

For the elderly population, the loss or reduction of functional status (bathing, dressing, transfers within their environment and performing instrumental activities of daily living) is closely associated with greater use of health services, isolation and residence in institutions; meaning that functionality is considered an important determinant of QoL among elderly people in Palliative Care[4,5].

Functional evaluation in Palliative Care is therefore fundamental for monitoring the evolution of disease and represents a valuable element in the decision making process, prognosis, diagnosis and prevention of adverse effects associated with functional decline.

However, despite the importance of functional status for health outcomes, data on functionality are rarely collected during routine care. The aim of the present integrative review was therefore to identify instruments that can be used in the functional assessment of elderly persons in Palliative Care.

METHOD

An integrative review of the literature was performed. This is defined as a specific review method that aims to provide a comprehensive view on a particular topic and which is useful for clinical practice. The present study followed the steps recommended for the method: formulation of the research question, search of primary studies, data extraction, evaluation of primary studies, analysis and synthesis of results and presentation[6].

The elaboration of the research question was based on the PICO strategy, in which "P" refers to the study population (elderly); "I" to the intervention studied or the variable of interest (palliative care); "C" to the comparison with another intervention (not used in this study) and "O" which refers to the outcome of interest (instrument of functional assessment)[7]. Thus, the guiding question of this integrative review was: "What instruments are available for the functional assessment of elderly persons in Palliative Care?"

The search for primary studies was performed in seven databases: PubMed, of the National Library of Medicine; Cumulative Index to Nursing and Allied Health Literature (CINAHL); Latin American and Caribbean Health Sciences Literature - LILACS; EMBASE; Physiotherapy Evidence Database - PEDro; Web of Science; and SCOPUS.

Controlled descriptors, keywords and their synonyms, and Boolean operators were used for cross-referencing in the databases as follows: PubMed (MeSH) – [(Aged) AND (Palliative care)] AND [(Assessment instruments)]; LILACS (DeCS - Descriptors in Health Science): "Idoso" AND "*Cuidados Paliativos*" OR "*Cuidado paliativo*" AND "*Inquéritos e Questionários*"; CINAHL (Research by words): "Aged" OR "Elderly" AND "Palliative care" AND "Assessment instruments" OR "Tool" AND "validation studies" OR "Validation"; EMBASE: (Palliative care) AND (Assessment instruments); PEDro: "Aged" AND "palliative care" AND "assessment instruments"; Web of Science: "Aged" OR "Elderly" AND "Palliative care"

AND "Assessment instruments" OR "Tool" AND "validation studies" OR "Validation"; SCOPUS: "Aged" AND "palliative care" AND "assessment instruments".

The articles that dealt with instruments for the functional assessment of patients in palliative care were included; although the study focused on the elderly population, instruments that did not specifically mention the elderly were included to ensure that this population is also implicitly included in the evaluation criteria of these instruments. Limits on date and language of publication were not applied to ensure the study was as comprehensive as possible. Articles that did not elucidate the use of instruments focused directly on the patient or on palliative care were excluded.

The search for the primary studies in the selected databases occurred in November 2017 and was carried out by a librarian under the supervision of the authors of the present integrative review.

A total of 472 primary studies were identified, of which 182 were from PubMed; 108 from CINAHL; 03 from LILACS; 42 from EMBASE; 08 from PEDro; 88 from the Web of Science; and 41 from SCOPUS. A total of 115 repeated studies were excluded using an electronic manager of bibliographical references. The abstracts of the studies were read, from which 305 were excluded, resulting in an initial sample of 53 articles that were read in their entirety prior to the final selection of 21 primary studies. The process of screening the articles is shown in the flowchart (Figure 1), as recommended by the PRISMA group[7].

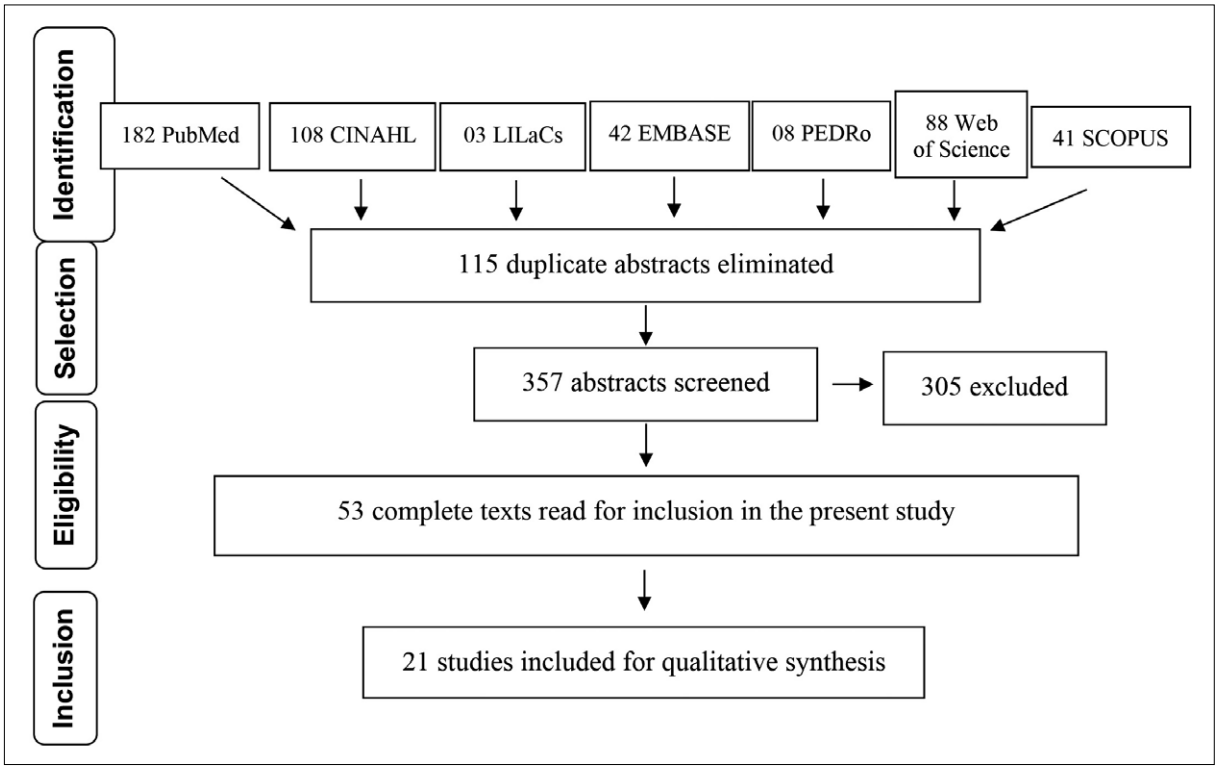

Figure 1. Flowchart of selection of studies found. Presidente Prudente, Sao Paulo, 2018.

Data extraction was performed after each of the selected articles was read, and the relevant aspects were synthesized, such as: year of publication, country where study was performed, journal title, level of evidence and instruments for the functional assessment of elderly persons in palliative care.

For the evaluation of the primary studies included in the present review, a validated instrument was used. The classification of the level of evidence followed the recommendations in literature[7,8], where: level I - systematic review or meta-analysis, randomized controlled trials; level II - evidence of at least one well-delineated randomized controlled clinical trial; level III - studies with well-delineated clinical trial methods without randomization; level IV – evidence of well-delineated cohort and case control study; level V - systematic reviews of descriptive and qualitative studies; level VI - evidence of a single descriptive or qualitative study and level VII: opinions of experts and authorities in the area studied.

The analysis and synthesis of the results were carried out in order to answer the guiding question of this investigation, the presentation of which follows the recommendations of the minimum set of items for evidence-based reports compiled by PRISMA[7,8], and which was registered in the PROSPERO system of literature reviews under number 77865 in August 2017.

RESULTS

In order to respond to the enquiry of this study, information related to the year of publication, the country where the research was carried out, the publication title, the level of evidence and the assessment instruments cited in each study to measure the functionality of elderly persons in palliative care were compiled (Table 1).

Chart 1. Characterization of primary studies selected by year, country, publication title, level of evidence and assessment instrument. Presidente Prudente, São Paulo, 2018.

Nº	Year	Country	Title of Publication	Level of evidence	Assessment Instrument
1	2017	Australia	*Recognizing older frail patients near the end of life: What's next?*[9]	V	*Comprehensive Geriatric Assessment* – CGA *Frailty Index* (FI) *Fried's frailty phenotype* *Clinical Frailty Scale* (CFS) *Fatigue Resistance Ambulation Illness Loss of weight* (FRAIL) *scale* *Groningen Frailty Indicator* (GFI) *EASYcare*-TOS *Edmonton Frailty Scale* (EFS) *Identification of Seniors at Risk* (ISAR) FRAIL-NH *scale*
2	2016	Poland	Functional assessment of the elderly with the use of EASYCare Standard 2010 and Comprehensive Geriatric Assessment[10]	III	*EASYCare Standard* 2010; *Comprehensive Geriatric Assessment* - CGA

to be continued

Continuation of Chart 1

Nº	Year	Country	Title of Publication	Level of evidence	Assessment Instrument
3	2005	USA	Assessment Instruments Clinics in Geriatric Medicine[11]	V	Karnofsky Performance Scale Activities of Daily Living (ADL) Instrumental Activities of Daily Living (IADL) *Eastern Cooperative Oncology Group Perfomance Status Scale* (ECOG *Perfomance Status*) *Rapid Disability Rating Scale* (RDRS) *Health Assessment Questionnaire* (HAQ) *Functional Independence Measure* (FIM) *Sickness Impact Profile* (SIP) *Time Up and Go test (TUG)* *European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire Core* 30 *items* (EORTC-QLQ-C30*)* *Functional Assessment of Chronic Illness Therapy* (FACIT) McGill *Quality of Life Questionnaire* (MQoL)
4	2003	USA	*The* RAI-PC: *An assessment instrument for palliative care in all settings*[12]	III	RAI-PC
5	2016	Belgium	An instrument to collect data on frequency and intensity of symptoms in older palliative cancer patients: A development and validation study[13]	IV	*Memorial Symptom Assessment Scale* *Edmonton Symptom Assessment System* *Rotterdam Symptom Checklist European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire Core* 30 *items* (EORTC-QLQ-C30) *Hospice Quality of Life Index McGill Quality of Life* (MQoL) *Functional Assessment of Chronic Illness Therapy and Spiritual well-being* *Symptom Assessment To Improve Symptom Control For Institutionalized Elderly* (SATISFIE)
6	2016	Belgium	*Usefulness, feasibility and face validity of the* interRAI *Palliative Care instrument according to care professionals in nursing homes: A qualitative study*[14]	IV	RAI-PC
7	2014	Norway	*The last three days of life: a comparison of pain management in the young old and the oldest old hospitalized patients using the Resident Assessment Instrument for Palliative Care*[15]	III	RAI-PC
8	2014	Canada	*Care planning needs of palliative home care clients: Development of the* interRAI *palliative care assessment clinical assessment protocols* (CAPs)[16]	IV	PC interRAI

to be continued

Continuation of Chart 1

Nº	Year	Country	Title of Publication	Level of evidence	Assessment Instrument
9	2008	Canada	*Reliability of the* interRAI *suite of assessment instruments: a* 12*-country study of na integrated health information system*[17]	III	InterRAI *Long Term Care Facility* (interRAI LTCF); InterRAI *Home Care* (interRAI HC); InterRAI *Post-acute Care* (interRAI PAC); InterRAI *Palliative Care* (interRAI PC); InterRAI *Mental Health* (interRAI MH).
10	2015	USA	Measuring End-of-Life Care and Outcomes in Residential Care/ Assisted Living and Nursing Homes[18]	III	*Family Perceptions of Physical and Family Care giver; Communication and the End of Life in Dementia* (EOLD); *Satisfaction With Care and;* EOLD-*Symptom Management*; EOLD-*Comfort Assessment in Dying; Mini-Suffering State Examination* (MSSE).
11	2016	Turkey	*Reliability and validity of the Turkish version of the* EORTC QLQ–C15–PAL *for patients with advanced cancer*[19]	IV	*European Organization for Research* (EORTC QLQ); *Treatment of Cancer Quality of Life Questionnaire* (C15-PAL).
12	2011	United Kingdom	Assessing quality-of-life in older people in care homes[20]	IV	*Evaluation of the Individual Quality of Life-Direct Weighting* (SEIQoL-DW)
13	2010	Sweden	*The Assessment of Quality of life at the End of Life* (AQEL) *questionnaire: a brief but comprehensive instrument for use in patients with cancer in palliative care*[21]	IV	*European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire Core* 30 *items* (EORTC-QLQ-C30)
14	2007	USA	*Measuring Patient-Oriented Outcomes in Palliative Care: Functionality and Quality of Life*[22]	V	*Karnofsky Performance Scale* (KPS) *Palliative Performance Scale* (PPS) *Short-Form Health Survey* (SF-36) *European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire Core* 30 *items* (EORTC-QLQ-C30*) The Functional Assessment of Cancer Therapy-General* (FACT-G) *The Quality of Life index* (QLI) *The Cancer Rehabilitation Evaluation System* (CARES) *McGill Quality of Life Questionnaire* (MQoL) *Evaluation of Individual Quality of Life* (SEIQoL) *The Functional Living Index–Cancer* (FLIC)
15	2008	Canada	Palliative care rehabilitation survey: a pilot study of patients' priorities for rehabilitation goals[23]	IV	Canadian Model of Occupational Performance (CMOP)
16	2007	USA	Quality-of-life Assessment in Palliative Care[24]	VI	*Karnofsky Score Edmonton Symptom Assessment; Memorial Symptoms Assessment Scale; European Organization for Research and Treatment of Cancer Questionnaire* (EORTC-QLQ-C30) *Quality and Quantity of Life Short Questionnaire; Cambridge Palliative Assessment Schedule.*

to be continued

Continuation of Chart 1

Nº	Year	Country	Title of Publication	Level of evidence	Assessment Instrument
17	2005	Australia	Measuring symptom distress among frail elders capable of providing self reports[25]	III	Symptom Assessment Scale
18	2016	Belgium	Frequency and intensity of symptoms and treatment interventions in hospitalized older palliative cancer patients: a multicenter cross-sectional study[26]	IV	*Assessment Symptoms Palliative Elderly* (ASPE); *Symptom Intervention Palliative Elderly* (SIPE);
19	2014	Holland	Symptoms and treatment when death is expected in dementia patients in long-term care facilities[27]	III	*Pain Assessment In Advanced Dementia* (PAINAD) *Discomfort Scale-Dementia Alzheimer type* (DS-DAT); *End-of-Life in Dementia scales- Comfort Assessment in Dying* (EOLD-CAD); *Mini Suffering State Examination* (MSSE)
20	2014	Belgium	*A Comparative Analysis of Comprehensive Geriatric Assessments for Nursing Home Residents Receiving Palliative Care: A Systematic Review*[28]	IV	InterRAI *Palliative Care* (interRAI PC); *McMaster Quality of Life Scale;* *Missoula*-VITAS *Quality of Life Index-Revised* (MVQOLI-R); *Modified Quality of Life Concerns in the End of Life Questionnaire* (mQOLC-E); *McMaster Quality of Life Scale* (MQLS); InterRAI PC and *Former Minimum Data Set*; *Palliative Care Outcome Scale* (POS);
21	2013	USA	A Symptom assessment in elderly cancer patients receiving palliative care[29]	VI	*Memorial Symptom Assessment Tool;* *Edmonton Symptom Assessment*; MD Anderson *Symptom Inventory;* *European Organization for Research and Treatment of Cancer's Quality of Life Core Questionnaire* (EORTC QLQ-C30); *Condensed Memorial Symptom Assessment Scale Rounding Tool;*

DISCUSSION

This integrative review sought to evaluate primary studies in the seven main databases used as references by health professionals in order to support the development of studies on palliative care in the context of gerontology. Applying the PRISMA protocol adds quality to the article, as such guidelines are focused on helping authors reduce publication bias and are a likely marker of rigor of conduct in Evidence Based Practice (EBP)[30]. From an overall perspective, all 21 articles analyzed are written in English and are based in countries considered to be developed and which have high longevity rates, implying that the Longevity Revolution is a reality that has been widely discussed and studied, unlike Brazil, which remains in the process of aging[31,32].

As for the publication dates, 12 articles were written in the last five years (from 2013); four articles between five and ten years ago (from 2008 to 2012) and five articles were published more than ten years ago (prior to 2007). These data demonstrate the use of current studies and, therefore, the relevance of the topic, as the constant updating of studies is a differentiating factor in research and clinical

practices: as the EBP movement itself breaks paradigms regarding the gaps between research and practice by promoting evidence from clinical surveys over the opinions of experts and institutions[33,34].

Also with regard to EBP, Levels of Evidence (LE) were applied and used to analyze the methodological route of the studies selected from the databases. In this EBP, articles classified as LE III and IV (seven and nine articles, respectively) and articles with LEs of between V and VI (three and two articles) predominated, or in other words, high methodological levels were not identified. While this is a worrying finding, as Systematic Reviews and Metanalyses represent a gold standard in EBP, it is important to realize that the guiding question of this analysis: "What instruments are available for the functional assessment of elderly persons in Palliative Care?" is normally answered through observational, methodological studies – for the validation of the instruments, integrative and narrative reviews, methodologies contemplated in the LE found[34].

To better understand the purposes of the scales evaluated, the discussion can be divided into two nuclei, namely: scales that assess the functionality and physical performance of patients in Palliative Care and scales that assess QoL and consequently include in their domains indexes that evaluate functionality as part of biopsychosocial care.

With regard to QoL, the European Organization for the Research and Treatment of Cancer Questionnaire (EORTC-QLQ-C30) and the InterRAI Palliative Care (RAI-PC) appeared in the greatest number of studies, with seven (33%) and six (28%) indications respectively; while the Edmonton Symptom Assessment, the Memorial Symptom Assessment and the McGill Quality of Life Questionnaire (MQoL) scales were found in three (14%) articles. The Enlarged Geriatric Assessment and the End-of-Life in Dementia - Comfort Assessment in Dying (EOLD-CAD) and Evaluation of the Individual Quality of Life-Direct Weighting (SEIQoL-DW) scales were used to evaluate QoL in two (9%) studies; the other scales appear in only one (4%) of the studies.

Regarding the assessment of functionality and physical performance, eight distinct scales and one test were identified and will now be discussed separately in order to better answer the research enquiry.

The Karnofsky Performance Scale (KPS), developed in 1948, is considered to be objective, practical and has undergone more than 50 years of validation with oncology and non-cancer patients. The level of functionality is assessed by the health professional with a percentage ranging from 100% (normal, no health complaints, no evidence of illness) to 0% (death); as it is strictly related to the levels of distress caused by symptoms, KPS is often used as a prognostic tool to predict life expectancy[11,35,36].

The Palliative Perfomance Scale (PPS) is based on a premise similar to the KPS. The original version, which consists of a one-dimensional scale, has been expanded to include the dimensions of mobility, activity, evidence of illness, self-care, intake, and conscious level. A health professional classifies each dimension by assigning a value of 100% to 0% (death), with 10% indicating the lowest level of functioning. Classifications of mobility, activity and evidence of disease dominate over the latter variables. For example, a patient who remains lying down or sitting all day (50% mobility score) but who has normal intake and normal conscious level (100% intake and conscious level) has an overall PPS score of 50%. Therefore, researchers and clinicians who plan to use PPS version 2 should consider whether this hierarchy reflects priorities for evaluating patients. The scale successfully predicts the need for hospital care; declining rates are associated with a deteriorating condition and death, while stable scores are associated with discharge and home care[35].

The Katz and Lawton Index separately assesses the need for assistance in both basic and instrumental activities of daily living. The Lawton & Brody index, developed in 1969, allows the evaluation of the autonomy of the elderly to perform instrumental activities of daily living (AIVD): telephone use, shopping, preparation of meals, household chores, washing of clothes, use of means of transportation, medication management and financial responsibility. For each IADL, the elderly person receives a score of dependent (1 point), needing assistance for activities (2 points) or independent (3 points). At the end, those who score between 19 and 27 points are considered independent, those who score from 10 to 18 points

semi-independent, and those who score below 9 points dependent[11, 37,38].

In the Katz Index, the elderly are evaluated through six parameters (ability to bathe, dress, go to the toilet, transfer, continence and food). The score varies from 0 (zero) to 3 (three), and 0 points are awarded for each activity that the elderly person can achieve without needing help, 1 and 2 points if they need nonhuman and human help respectively, and 3 points if dependent for that activity. After the evaluation, the points are added together and the individual is classified into one of three categories: independence (<6 points); moderate dependence (7 to 16 points) and severe dependence (over 16 points)[11, 37,38].

The Rapid Disability Rating Scale (RDRS) is also responsible for evaluating instrumental activities of daily living. It corresponds to a four-point scale, and includes eight items related to activities of daily living, three in mental capacity and one on changes in diet, continence, medications and mobilization in bed; it is particularly suitable for elderly patients, and can be applied in hospitals and nursing homes, but it is little used in clinical practice. The degree of need for day-to-day help, the degree of disability and the degree of special problems are taken into account, with the highest score being 54 and higher scores indicating greater difficulty[11,39].

The Health Assessment Questionnaire (HAQ) is an instrument developed three decades ago by James F. Fries and colleagues from Stanford University as a self-reported assessment model that analyzes physical function. It has strong reliability and validity, and is widely used in patients with rheumatic diseases, HIV/AIDS and elderly people. It is a good descriptive tool, but may be less appropriate for measuring clinical changes[11,40].

The Functional Independence Measure (FIM) aims to assess the burden of care required by an individual, and is an instrument for assessing disability with various types of functional restrictions. It consists of 18 items that evaluate six different areas comprising motor and cognitive items and has a graded system of patient response that alternates from one to seven; the total score ranges from 18 to 126, with a high score synonymous with greater independence. It is well validated but its use is limited in clinical practice except in rehabilitation settings[11,41].

The Sickness Impact Profile (SIP) is designed to measure patients' dysfunction through their daily behavior. This scale focuses on the patient's ability to move within the home, leave the home and use transportation. Its overall result ranges from 0% to 100%, where 0% represents completely healthy and 100% completely dependent patients. It was developed at the University of Washington in Seattle, USA. It is now used by numerous institutions around the world and is the official QoL questionnaire at Johns Hopkins University in Baltimore. The Questionnaire consists of 136 yes/no questions that represent specific activities divided into twelve general categories; its use is usually connected to research[11,42].

The Timed Up and Go (TUG) test involves the observation of the patient getting up from a sitting position, walking ten feet, turning, returning to the chair, and sitting down. A score of more than 20 seconds should lead to further evaluation. It is a simple and reliable measure of mobility and can be useful for following functional decline over a period of time[11].

The Short-Form Health Survey (SF-36) consists of eight subscales that measure limitations in physical and social activities caused by physical health and emotional problems, as well as physical pain, general mental health, vitality and general health perceptions[22].

In general, as a result of the analysis, it was identified that QoL assessment is linked to Palliative Care as an essential part of a care plan, and is a factor that directly influences the functionality of a patient.

It is notable that the development of the World Health Organization Quality of Life instrument (WHOQOL) was the first step in finding a consensus on definitions of QoL. The World Health Organization brought together experts from around the world who defined QOL as the individual's perception of their position in life in the context of the culture and value system in which they live and in relation to their goals, expectations, standards and concerns. The most important question is the patient's perception of the cultural, social and environmental context in which they are inserted, interrelating the environment with physical, psychological, independence, social relations and personal beliefs[43].

Also included in the instruments that measure QoL is the WHOQOL-old, modified for the elderly, which evaluates QoL through six domains: assessment of sensory functioning, autonomy, present, past and future activities, social participation, death and dying and intimacy[44]. It is perceived that, even though it is an instrument directed at subjective questions (such as death and dying), autonomy and functionality are included as extremely relevant points for the well-being of this population.

Working in an integrative manner therefore requires the efforts of an interdisciplinary team that is prepared to extrapolate the hegemonic, biomedical model. Specific concepts of gerontology and palliative care such as geriatric syndromes, rehabilitation, frailty, independence and autonomy require that professionals work in a broader manner, focused on the biopsychosocial model; in this case, the concept of health is related to maintaining autonomy and functionality even in the presence of chronic diseases[31].

It is known, however, that this model of work is strongly linked to the structuring of networks and training of professionals for extended clinical care. As a resource to enable this kind of care, assessments can be a great support for health professionals in preparing an adequate care plan for the elderly population in Palliative Care.

One limitation of the present study was the impossibility of verifying if the scales presented are already available in Portuguese or if they are validated for scientific use in Brazil. The relevance of the research should be highlighted, however, as it brings together up to date evidence from different instruments to assess the functionality of the elderly in palliative care in very specific scenarios.

CONCLUSION

The search for scientific evidences in seven databases, with the selection of 21 primary studies through the rigid methodological design of Evidence Based Practice, allowed the identification of 19 instruments of assessment, of which eight scales and one test were recognized as suitable for the functional assessment of elderly patients in palliative care.

This analysis allowed it to be understood that functional scales also provide guidelines for improving the Quality of Life of elderly people in Palliative Care, representing an alternative of evaluation when other resources are not available or are not known to the professionals of the team. In addition, the study demonstrated that it is practically impossible to disassociate physical functionality from social and psychological factors.

There is therefore a need to verify the availability of these instruments in Portuguese and for use in Brazil. Now studies should be carried out with a methodology of translating and validating these instruments in order to provide reliable tools for the assessment of the elderly in palliative care.

Training of the multiprofessional team and changes in professional education are necessary to allow a broader view of the elderly in Palliative Care, in order to direct the results of the scales towards humanized and integral care.

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Evaluation of lifestyle and quality of life in the elderly: a literature review

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Abstract

Objective: to analyze Brazilian and non-Brazilian scientific production that considers the relationship between the lifestyle and quality of life of the elderly. *Method:* an integrative review of literature was performed in the Scopus, PubMed, Virtual Health Library and PsycINFO databases. Four cross-searches were adopted: the English synonyms of the word "elderly" ("Aged", "Aging", "Old age" and "Elderly") with the terms "Quality of life" and "Lifestyle". *Results:* after the adoption of the inclusion and exclusion criteria, 21 articles were analyzed. Physical activity, diet, body composition, alcohol intake, smoking and social relations were the main components of lifestyle investigated. The studies show that these factors influence the perception of the quality of life of the elderly. In addition to these factors, sociodemographic characteristics, functional capacity, sleep quality and comorbidities are also factors that influence the quality of life of the elderly. *Conclusion:* interest in the relationship between the lifestyle and quality of life of the elderly has increased in recent years. It was observed that the lifestyle of the elderly has been investigated in several ways, however no qualitative studies were found using the search criteria adopted in this review. As future perspectives, it is hoped that tools for evaluating the lifestyle of the elderly will be developed and qualitative investigations will be carried out in order to obtain a deeper understanding of the specificities that exist in the relationship between the lifestyle and levels of quality of life in old age.

Keywords: Health of the Elderly. Life Style. Quality of Life. Review.

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INTRODUCTION

The world is undergoing a process of sociodemographic transition, and the fastest growing age group is those aged over 60[1]. Global aging represents a major challenge as it can even influence the development of countries, bringing about economic and social change[2]. Increases in life expectancy also have consequences for public health. The conditions in which a population ages are a growing concern due to the increase in the number of recurrent diseases among the elderly[3]. From this perspective, there may be changes in the health and quality of life of the elderly population, making it important to understand the risk and protective factors that influence these components[4-6].

The World Health Organization Quality of Life (WHOQOL) – the research into quality of life group of the World Health Organization[7] – defines quality of life as a comprehensive concept that involves not only physical health but also psychological state, level of independence, social relationships, personal beliefs and other characteristics involved in the environment of the individual, including a system of values involving goals, expectations, standards and worries[7]. Investigating the factors that can influence the perception of quality of life of an individual such as the state of health and socioeconomic factors is of great importance. The components of lifestyle have also been investigated as one of these factors.

Lifestyle is characterized as a set of habits, choices and customs experienced by individuals throughout life. Among these habits and choices are the ingestion of alcoholic beverages, smoking, diet, physical exercise and others[8]. The absence of smoking, low alcohol consumption and the practice of physical exercise are associated with a better Quality of Life[4,9,10]. There is also considerable scientific interest in how other components such as diet and social aspects influence the individual's perception of their quality of life[4, 9,11-17].

Thus, in view of the possible influence of lifestyle behaviors on quality of life, the objective of this study was to analyze Brazilian and non-Brazilian scientific production that analyzes the relationship between the lifestyle and quality of life of the elderly.

METHOD

A systematic literature review was carried out in the Scopus, PubMed, Virtual Health Library (VHL) and PsycINFO databases from June 5 to June 30, 2017. Four cross searches were used using the English synonyms of the word "*idoso*" *("Aged", "Aging", "Old age"* and *"Elderly"),* commonly associated with the theme of the study, with the terms *"Quality of life"* and "*Lifestyle*" which are descriptors indexed to the Health Science Descriptors (DeCS) system. We chose to use the terms in English since the search using the descriptors in Portuguese presented a limited number of findings. Due to the large number of works found with the search in English, it was decided to delimit by date, in order to identify the most updated bibliography on the subject. Thus, articles published between January 1, 2012 and January 7, 2018 were included.

The Scopus database was chosen due to its multidisciplinary nature. On this basis, the "all fields" option was selected and, in the "document type" section, it was decided to include only articles ("article"). The PubMed database was used as it is considered one of the most relevant sources of health research today. In this, the following filters in the advanced search were selected: "Title/abstract" and, in "article type", only "journal article". The VHL database was chosen because of its coverage throughout Brazil and the search was carried out using the "Limit" filter, selecting the "human" option so that the search was performed only in studies that used human samples. Finally, as the construct quality of life is widely studied in the field of psychology, PsyINFO, which is considered one of the most important databases in this area was chosen, and an advanced search using the "any field" option was used.

After insertion of the articles that fulfilled the inclusion criteria described above, four documents were created for each database from the searches performed - "*Aged*" and "*Quality of life*" and "*Lifestyle*" (document 1), "*Aging*" and "*Quality of life*" and "*Lifestyle*" (document 2) "*Old age*" and "*Quality of life*" and "*Lifestyle*" (document 3), "*Elderly*" and "*Quality of life*" and "*Lifestyle*" (document 4) - containing the titles of all the references found. As for the exclusion criteria, articles that were duplicated in the databases were identified and deleted. Thus, the documents were compared until each article appeared only once.

In the second stage, the titles and/or abstracts were read. At this stage, documents such as chapters of books, commentaries and dissertations were excluded so that only articles were considered. Those that did not have the evaluation of quality of life and/or lifestyle (Stage 3) as their main objective were excluded. We also excluded those where the abstracts not available (Step 4), those that did not use empirical methodology (Step 5) and those that included individuals under 60 in their sample (Step 6).

In the last step, studies that were not fully in Portuguese, English or Spanish (Stage 8) were excluded. Finally, the articles included were searched in full. In addition to the databases themselves, the Capes Periodical Portal was used as a resource for access to the full texts. Those articles that were not free access were also excluded.

After the inclusion and exclusion criteria were applied, a thorough reading of the articles was carried out. In the analysis of the data, we sought to extract the following information from included studies: 1) authorship and year; 2) country of publication; 3) methodology used; 4) characteristic of the sample; 5) instruments used to assess the quality of life; 5) lifestyle components analyzed. Finally, the analysis and interpretation of the data of each study included in this review was performed. The findings that were found in these studies were organized and discussed considering the three main axes: quality of life of the elderly, lifestyle components of the elderly, lifestyle and quality of life of the elderly.

RESULTS

In total 8516 documents on the lifestyle and quality of life of the elderly were found based on the criteria used in the searches. Table 1 shows the number of documents found in each of the databases by combination of keywords.

After applying the exclusion criteria adopted, a total of 24 articles were submitted for final analysis. Table 2 and Figure 1 present in detail the articles excluded according to each pre-established criterion.

Table 1. Number of publications found in each database. Juiz de Fora, Minas Gerais, 2018.

Combinations	Scopus	Pubmed	BVS	PsicINFO	Total
"aged" AND "quality of life" AND "lifestyle"	2132	427	1560	460	4579
"aging" AND "quality of life" AND "lifestyle"	687	121	235	134	1177
"old age" AND "quality of life" AND "lifestyle"	483	40	426	14	963
"elderly" AND "quality of life" AND "lifestyle"	515	273	964	45	1797
Total	3817	861	3185	653	8516

Table 2. Number of publications excluded based on criteria from databases. Juiz de Fora, Minas Gerais, 2018.

	Scopus	Pubmed	BVS	PsicINFO
Initial total in each database	3817	861	3185	653
Exclusion Criteria				
Articles in duplicate	2998	750	1485	411
Other types of documents	0	0	0	42
Articles without instruments of evaluation of Quality of Life	705	110	1142	168
Abstracts not available	0	0	2	0
Non-empirical studies	0	0	49	0
Sample less than 60 years old	98	0	348	30
Articles without evaluation of any component of Lifestyle	9	0	141	2
Articles in other languages	1	0	0	0
Articles not available in entirety	0	0	1	0
Total for analysis	6	1	17	0

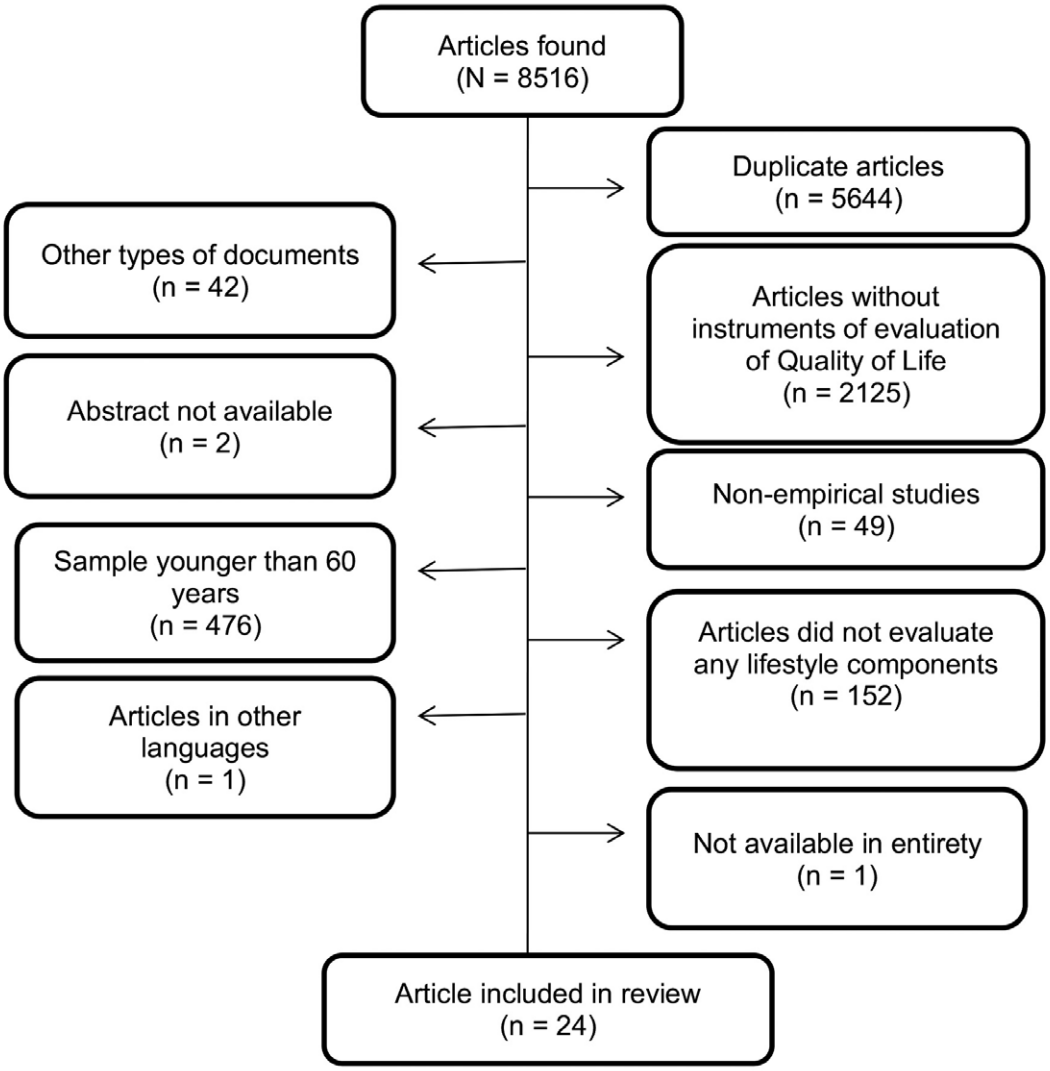

Figure 1. Number of excluded publications based on total number of articles. Juiz de Fora, Minas Gerais, 2018.

It is important to stress that while the terms *"aged", "aging", "old age"* and "*elderly*" were used during the search, the samples of many of the articles found were not exclusively of elderly persons. As one of the established objectives of this review was to identify the current panorama of these studies specifically among the elderly public, only articles with samples of individuals over 60 years were considered. Another fact is that, despite using the term "quality of life" or "lifestyle" in the title, abstract or keywords, many investigations did not attempt to evaluate the relationship between these constructs and were therefore deleted. After the selection and analysis of the articles covered in this review (N=21) the authors, year and country of publication, method used, sample characteristics and lifestyle behaviors of each study were assessed. Table 1 presents this information in detail..

Chart 1. Studies on lifestyle and quality of life of the elderly. Juiz de Fora, Minas Gerais, 2018.

Reference (year)	Country and sample	Method	Lifestyle Components evaluated in study
Zaragoza-martí et al.[18] (2018)	Spain 351 elderly men and women aged over 60	Quantitative Cross-sectional	Smoking Alcohol Body composition Physical activity Diet
Bayán-Bravo et al.[19] (2017)	Spain 1,323 elderly men and women aged over 60	Quantitative Cross-sectional	Smoking Alcohol Physical activity Diet Body composition
Máchon et al.[20] (2017)	Spain 800 elderly persons aged over 65	Quantitative Cross-sectional	Smoking Social conviviality Physical activity Nutritional risk
Gouveia et al.[20] (2017)	Portugal 802 elderly men and women, distributed in two groups (60-69 and 70-79 years)	Quantitative Cross-sectional	Physical activity Body composition
Moreno-Vencino et al.[22](2017)	Spain 463 elderly women aged between 66 and 91 years	Quantitative Cross-sectional	Body composition
Camelo et al.[23] (2016)	Brazil 366 elderly men and women aged between 60 and 94 years	Quantitative Cross-sectional	Social aspects Diet Level of physical activity Smoking
Cerin et al.[12] (2016)	China 900 elderly men and women aged over 65 years	Quantitative Longitudinal	Physical activity Neighborhood environment Social relations
Chatziralli et al.[9] (2016)	Greece 114 elderly men and women aged between 65 and 75 years diagnosed with muscular degeneration	Quantitative Cross-sectional	Smoking Alcohol consumption Physical exercises Walking
Dohrn et al.[24] (2016)	Sweden 96 elderly men and women aged between 66 and 86 years with osteoporosis	Quantitative Cross-sectional	Physical activity Gait speed Duration of sedentarism
Marques et al.[13] (2016)	Brazil 1131 elderly men and women aged over 60	Quantitative Cross-sectional	Employment Internet use Physical activity Religiosity Participation in religious groups or lifestyle
Naughton et al.[4] (2016)	USA 26299 women aged 80 or over	Quantitative Longitudinal	Physical activity Body composition; Smoking

to be continued

Continuation of Chart 1

Reference (year)	Country and sample	Method	Lifestyle Components evaluated in study
Pan et al.[11] (2016)	China 5557 elderly persons aged over 60	Quantitative Cross-sectional	Tea-drinking Diet Smoking Alcohol consumption Open air activities
Aguero e Leiva et al.[14] (2015)	Chile 271 elderly men and women aged between 80 and 90	Quantitative Cross-sectional	Dietary habits
Blair et al.[25] (2015)	USA 1776 elderly women who had survived cancer and 12599 elderly women without cancer aged between 73 and 88 years	Quantitative Longitudinal	Physical activity Smoking Dietary habits Body composition
Harada et al.[26] (2015)	Japan 1351 elderly men and women aged between 65 and 74 years	Quantitative Cross-sectional	Physical activity
Meneguci et al.[15] (2015)	Brazil 3206 elderly men and women aged over 60	Quantitative Cross-sectional	Time seated
Duran et al.[27] (2014)	Chile 975 elderly men and women aged over 60	Quantitative Cross-sectional	Body composition
Freitas et al.[28] (2014)	Brazil 60 elderly men and women (30 physically active and 30 physically inactive) aged over 60	Quantitative Cross-sectional	Physical activity
Milla et al.[17] (2014)	Chile 1285 elderly men and women aged over 60	Quantitative Cross-sectional	Eats breakfast Body composition
Atkins et al.[16] (2013)	Australia 626 elderly men and women aged over 60	Quantitative Cross-sectional	Level of physical activity Open air activities Social relationship Consumption of alcohol Time seated
Silva et al.[29](2012)	Brazil 50 elderly men and women aged over 60	Quantitative Cross-sectional	Level of physical activity
Footit and Anderson [30] (2012)	Australia 328 elderly men and women aged over 65	Quantitative Cross-sectional	Diet; Physical activity Smoking Alcohol consumption Health Promotion
Guedes et al.[31] (2012)	Brazil 1204 elderly men and women aged over 60	Quantitative Cross-sectional	Physical activity
Porto et al.[32] (2012)	Brazil 199 elderly men and women aged between 60 and 70 years	Quantitative Cross-sectional	Physical activity

Regarding the countries of origin of the studies, Brazil (n = 7) produced the most work on the subject, followed by Spain (n=4) and Chile (n=3). The most publications were published in 2016 (n = 8), followed by 2012 and 2017 (n=4). All the articles had a quantitative approach and only three employed the longitudinal method[4,2,25].

DISCUSSION

With increased life expectancy it is important to understand the factors that influence the quality of life of the elderly, as well as the components of lifestyle that can impact it. The present study found that studies have been carried out on this subject in countries of Europe, North America, Asia, Oceania and Latin America, demonstrating the importance given to the topic in a global context. There is notable productivity in Latin America, mainly in Brazil and in Chile. This can possibly be explained by the speed of population aging in developing countries. In Brazil, for example, due to the fall in fertility rate and the reduction of mortality in all age groups, the population aged 60 and over has reached 19.6 million people, and will climb to 41.5 million by 2030[33].

In addition, the majority of the studies were carried out with samples of people aged 60 and above, with no age limit, and the sample was not stratified in order to compare differences related to age group. In this sense, it is worth emphasizing the importance of further studies that evaluate lifestyle and quality of life in different phases of aging. This aspect is considered an important moderator if effective quality of life and lifestyle interventions are to be planned for each age group[1]. None of the articles included in this review adopted a qualitative approach, demonstrating the need for studies that explore this theme more deeply, in order to understand the specificities of lifestyle and quality of life present in the narrative of the elderly.

To better understand the issues related to the evaluation of the lifestyle and quality of life of the elderly, we chose to divide this review into three central themes that will be discussed below.

Quality of life of the elderly

Given the subjective and multidimensional nature of the concept of quality of life, the instruments used for its evaluation are divided into dimensions and describe the individual's perception of their quality of life. The most used instrument in studies that relate style and quality of life is the Medical Outcome Study 36- item Short Form (SF-36)[9,21,24,25,28,30], composed of 36 items divided into eight domains: functional capacity, physical aspects, pain, general health, vitality, social aspects, emotional aspects and mental health. The score of each domain can vary from 0 to 100, with scores close to 0 representing a worse perception of quality of life while those close to 100, a better perception of quality of life[2,4]. Instruments similar to the SF-36 are also used as quicker to apply alternatives, such as the Medical Outcomes Study 12-Item Short-Form Health Survey (SF-12)[23] and Medical Outcomes Study Short Form 8-Item Health Survey (SF-8)[15].

According to the findings of this review, in addition to lifestyle, the factors that influence the quality of life of the elderly are: gender [9,14,15,23], age[13,15,21,23], schooling [4,13,15,23], ethnic group[4,23], physical capacity[4,10,15,21-24], diseases[4,9,21,23,24] and income[23]. In the study by Camelo et al.[23], women over 70 years of age and with less than four years of schooling had a worse health-related quality of life in the physical and mental domains of SF-12 than men. In the physical domain of this same instrument, black women with incomes less than four times the minimum salary also had a worse quality of life. In contrast, in a study of women over 80 years of age conducted by Naughton et al.[4], those with a higher education level than high school and who were married had the best quality of life scores. This was also a finding in the study by Marques et al.[13], in which elderly people aged between 60 and 69 years and with more than 12 years of schooling also had a better quality of life.

Good quality of sleep is also associated with better quality of life among the elderly. It is important to understand which lifestyle components can influence quality of sleep. In a study carried out by Moreno-Vencino et al.[22], it was observed that central obesity

is associated with poorer sleep quality in elderly women, which also had an influence on the poor quality of life of this public.

The functional capacity of the elderly has also been strongly related to a better perception of quality of life[15,21-24], as functional limitations among the elderly interfere with their mobility, social conviviality and autonomy influencing the perception of Quality of Life of these individuals. A worse functional status was also associated with greater psychological distress and lower quality of life in a study by Atkins et al.[16]. These results demonstrate the importance of adopting behavior during life that maintains good functional capacity in old age.

Studies have also been conducted that investigate the influence of diseases on the quality of life of this public. Comorbidities are important factors that influence the perception of the quality of life of the elderly. There are indications that the higher the number of diseases, the worse the perception of quality of life[23,25]. This is an important fact that reinforces the importance of disease prevention, especially chronic diseases, as these can disrupt or cause various complications for the health of the elderly, thus impairing their quality of life. According to these same studies, interventions that seek to improve the social support network and increase the level of physical activity of the elderly can improve the perception of their quality of life in cases where diseases are already installed[23-25].

It is also possible to understand that social and economic indicators influence the evaluation of the quality of life of the elderly [4,23,34]. In the study by Andrade et al.[34] single, divorced and widowed elderly persons had a lower average quality of life. Regarding ethnicity, in the study of Camelo et al.[23], black women presented the lowest scores in the physical domain of the instrument that evaluated quality of life, the SF-12. These results corroborate the findings of Naughton et al.[4], in which African-American women older than 80 years, also had the worst quality of life scores. Also in the study of Camelo et al.[23], elderly persons with a family income below four times the minimum wage had the worst quality of life scores, demonstrating that income can also influence the evaluation of this construct.

Studies that demonstrate the influence of sociodemographic characteristics on the perception of the quality of life of this population are important, since these factors interfere in health status, social support network and access to health promotion programs, among others[4,23, 34]. These investigations are also relevant, as they can support the elaboration of strategies to improve the living conditions of these people and, consequently, the perception of quality of life of this public[34].

All the factors mentioned here influence the way of life of the elderly person, interfering with their autonomy, their capacity to take care of themselves and to relate to others with consequences for their physical and emotional health and, consequently, their quality of life.

Lifestyle components of the elderly

There are a number of instruments for evaluating the lifestyle of individuals or groups, such as the Fantastic Lifestyle index[35], the Breslow's Life Style Index[36] questionnaire and the Pentacle Social Welfare Foundation[37]. None of these instruments is specific to the evaluation of the lifestyle of the elderly, meaning in the great majority of studies this construct is evaluated through questionnaires developed by the researchers themselves [9,11,13,15,23,25,30].

Some components are often analyzed in studies that address the issue. Factors such as smoking, alcohol consumption and family and social relationships have been considered, mostly by means of sociodemographic questionnaires, in order to characterize the sample [2,4,5,9,14,15,25]. This information becomes important as it directly affects the longevity and way of life of the elderly. Smoking and alcohol consumption are responsible for several diseases, including the occurrence of chronic diseases[38-40]. Social and family relationships have great importance for the emotional health of the elderly. The elderly person's life in the family, at work or in the community, increases their social support by dialoging directly with mental health and contributing to the Quality of Life of the elderly[4,13,15,16,23,27-29].

Physical activity in this age group has also been significantly investigated in this age group. Some studies have evaluated the levels of physical activity through the International Physical Activity Questionnaire (IPAQ)[12,15,28,29,31,32]. This questionnaire allows the weekly time spent in physical activities of moderate and vigorous intensity present in daily life through work, transportation, domestic tasks and leisure to be evaluated, and also the time spent in passive activities performed in the sitting position[42]. It is important to remember that the practice of physical activity in the elderly is an important factor for the improvement of functional capacity, integration in society and mental health[4,9,13,43].

Body composition is also an important factor to be evaluated in this age group as body modifications occur in aging that lead to a greater accumulation of fat and reduction of lean mass, predisposing the individual to a series of chronic diseases[44]. In the articles included in this review, most of the studies used the Body Mass Index (BMI) as a physical evaluation method. While it is known that BMI is not a good predictor of body composition due to changes in body composition in aging such as fat gain, the reduction of height and water levels, it is used to its ease of measurement and low cost[45,46].

Diet was also identified as a component of the lifestyle of the elderly[2,25,27,30]. As it is known that a suitable diet is an important protector of chronic diseases, it becomes an important aspect for the health of the elderly. It is also necessary to take into account nutritional specificities during aging and the psychosocial aspects that can interact with food in this phase of life[47].

Lifestyle and quality of life of the elderly

From the results of the articles included in this review, it is understood that the set of choices and habits of an individual, known as lifestyle, can influence the quality of life of the elderly, both positively and negatively. The main components addressed in the studies with the elderly were: physical activity, diet, body composition, alcohol intake, smoking and social relations.

Data related to physical activity were widely addressed in literature and were positively related to quality of life [5,9,13,15,21,22,24,25,28,29]. A longitudinal study conducted between 1986 and 2004 with two groups of women, one cancer survivors and the other free from the disease, found that both groups presented a worse quality of life when the participants were physically inactive[25].

Physical activity can also influence quality of life as it interacts with other lifestyle components. Research conducted by Meneguci et al.[15] shows that elderly people who spent more time sitting, as well as having lower scores in the physical domains of the instrument of quality of life used, tended to have less social participation, influencing the overall scores of the instrument.

A similar result was also found in the study by Freitas et al.[28], in which active and inactive elderly women were analyzed, and the former had higher scores in the psychological domains of quality of life. Social interaction has been shown to be an important component that influences the quality of life of the elderly. Dissatisfaction with social relationships was associated with low scores in the mental health field of the SF-12 in a study by Camelo et al. In another study conducted by Marques et al.[13], participation in religious groups, use of the Internet, and changes in social relations were associated with better quality of life.

Body composition is also related to quality of life in a number of studies[4,15,19,21,22,27]. In the study by Gouveia et al.[21], the BMI results of the sample had a negative correlation with quality of life related to the health of the elderly. It is important to note that this factor is a consequence of other lifestyle components such as exercise and eating and also dialogues with other factors such as sleep quality[22,27], or in other words, as it influences quality of sleep, this factor also influences the quality of life of the elderly.

Body composition and alcohol consumption and smoking, besides being negatively related to quality of life, can also cause other factors such as comorbidities resulting in a worse quality of life. As the study by Naughton et al.[4] and Atkins et al.[16], neither smoking nor alcohol were independent predictors of quality of life.

Food also appears to be related to quality of life. The lower intake of vitamins and minerals, especially in women, was associated with greater daytime sleepiness and, consequently, a moderate perception of Quality of Life[14]. In a study developed by Pan et al.[2], the main relationship analyzed was on the influence of tea consumption on quality of life, which presented a positive correlation. However, lifestyle-related data such as smoking, alcohol consumption, food and outdoor activities were collected, thus raising the hypothesis that lifestyle variables may be related to the results found in the study, that is, a better quality of life would not be directly related to tea consumption, but rather to a series of variables related to lifestyle.

In another study by Milla et al.[21], which analyzed the influence of eating breakfast on quality of life, it was concluded that breakfast affected the nutrition domain of the instrument of quality of life used, thus affecting the overall quality of life score. The octogenarian sample of Aguero and Leiva et al.[14] presented excess energy in their diet and insufficient amounts of vitamins and minerals, especially in women. This condition was associated with a moderate perception of quality of life.

It is important to emphasize that the present study has limitations in relation to the delimitation by date, including only articles of the last five years, and the non- inclusion of other databases, for example, those that include dissertations and theses. These delimitations were chosen as this theme presents a large number of published works, making it impossible to analyze all of them. However, the delimitation of dates allows the current panorama of research related to the style and quality of life of the elderly to be described.

CONCLUSION

Interest in the relationship between the style and quality of life of the elderly has increased in recent years. This review revealed that the lifestyle of the elderly has been researched in a variety of ways. Of the lifestyle components discussed in the literature, physical activity, body composition, alcohol and tobacco use and diet are the variables most related to the study of quality of life. However, it is important to emphasize that these factors are not always independent predictors of a good quality of life.

The relationship of psychosocial aspects (family support network and friends, stress management, participation in religious groups, among others) has also been investigated. It can be suggested that one significant difficulty of investigating components of lifestyle is the lack of tools that meet the specificities of the lifestyle of the elderly and that allow the evaluation of several components at the same time. In this sense, it is important to emphasize once again the evident interaction of lifestyle components in the improvement or deterioration of quality of life of the elderly.

It was observed that quality of life is the product of a series of behaviors adopted by the elderly, and is not influenced by only one component. In addition, social factors such as income, ethnicity, schooling and marital status can also interfere in the living conditions of this population and consequently in their perception of quality of life.

It is hoped that tools for evaluating the lifestyle of the elderly and qualitative investigations are developed in order to obtain a deeper understanding of the specificities that exist in the relationship between the lifestyle and levels of quality of life of this group in the different stages of aging.

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Elder abuse in Brazil: an integrative review

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Abstract

Objective: the present study aimed to carry out an integrative review of literature on the scientific knowledge relating to the occurrence of elder abuse produced in Brazil between the years of 2013 to 2017. *Method*: a bibliographic survey was carried out through publications indexed in the Virtual Health Library (VHL) database: the Scientific Electronic Library Online (SCIELO), Latin American Literature in Health Sciences (LILACS) and the CAPES Portal of Periodicals (CAPES). The data collection instrument, created by the authors, included characteristics such as: year of publication, main journals, research design, topics covered, main areas of knowledge, sampling and study objectives. *Results*: 28 publications were analyzed. The main types of violence were psychological (28%), physical (28%), unspecified (16%), financial (12%), self-abandonment (8%), neglect and verbal violence (4%). The majority of the victims were female (64%), of unspecified gender (28%) and male (8%). *Conclusion*: the present integrative review found that the main violence suffered was psychological together with physical, with the elderly the main victims. The main place of maltreatment was in the home. The research also found that there are gaps in information about the reasons that triggered the aggressions. It is therefore necessary to investigate this subject further and carry out new studies that seek to identify these factors.

Keywords: Elder Abuse. Domestic Violence. Health of the Elderly.

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INTRODUCTION

Longevity can be considered one of the great modern-day achievements. However, the significant increase in the elderly population in Brazilian society has led to the emergence of new challenges in relation to the formulation of public policies and actions of health promotion and prevention[1]. Problems have also emerged from this new scenario, such as elder abuse, which has grown significantly in recent years and has already been recognized as a public health problem[2].

Violence has been present throughout history and represents a relationship of the power of the strongest against the groups considered most vulnerable, including children, women and the elderly[3]. Violence can be understood, according to Reis et al.[4], as a violation of the integrity of the victim, be it physical, sexual, psychic or moral.

Although violence against the elderly has existed from the earliest of times, the first articles dealing with "elder abuse" first appeared in 1975 in British scientific journals as "beating the grandparents"[5,6]. In Brazil, this theme has only become a subject for debate in the last two decades, due to the growing numbers of elderly people in the population and also because of an increasing number of reports of violence [7].

The World Health Organization (WHO) defines violence against the elderly as a single or repeated act, or lack of appropriate action, intentional or unplanned, causing harm or unnecessary distress and a reduction in the quality of life of an older person[8,9]. It can be practiced inside or outside the home environment, by a member of the family or even by persons exercising a relationship of power over the elderly, such as caregivers[9].

Brazilian scientific literature shows that the family context and the residence of the elderly person are the main locus for the occurrence of violence, with physical and psychological abuse and neglect the most notable forms[9,10]. However, violence is a social phenomenon that affects the elderly in different ways, on a daily basis, directly or indirectly, in the social, economic, political and institutional spheres, and remains a subject that is little explored in research[11].

Elder abuse is a violation of human rights and a major cause of physical or mental injury, resulting in hospitalizations, morbidities, disabilities, depression, loss of productivity, isolation and despair in this population[8,12].

To discuss violence against the elderly is to address a serious public health issue. However, Brazilian scientific production on the subject is still incipient. This reveals a need for further investigations, leading to reflections that will support society in the defense of the elderly and the fight against violence. We therefore used the following guiding question for the development of this study: which variables of violence are addressed in the scientific knowledge produced in Brazil in the period from 2013 to 2017 in relation to elder abuse? In order to answer this question, the present study aimed to analyze and systematize the scientific production about violence against the elderly in Brazil in the last five years through an integrative review of literature.

METHOD

The present study consisted of an integrative bibliographical review. This approach allows theoretical and empirical studies carried out on a certain phenomenon which one wishes to investigate to be systematized and evaluated[13]. In the case of the study in question, the subject of interest is the profile of studies on elder abuse in Brazil in the last five years.

The study adopted the following steps: delimitation of the problem; definition of databases and descriptors; establishment of exclusion criteria and inclusion of articles to be selected to compose the sample; definition of the information extracted from the selected studies; analysis and evaluation of studies included in the integrative review and interpretation of data and results[13].

The bibliographical survey was carried out in publications indexed in the database of the Virtual Health Library (VHL): Scientific Electronic Library Online (SCIELO), Latin American Literature in Health Sciences (LILACS) and the CAPES Portal of Periodicals (CAPES). These databases were chosen to allow the identification of only works carried out in Brazil between the years of 2013 to 2017.

To select the articles, four researchers analyzed the databases by year of publication. The selection was standardized to ensure each researcher followed the following inclusion criteria: a) articles produced in Brazil; b) between the years 2013 and 2017; c) national studies; (d) available in full; e) with relevance and adherence to the proposed objective and which addressed the following descriptors: "elder abuse", "violence against the elderly", "neglect of the elderly" and "abandonment of the elderly". The exclusion criteria were: bibliographic review articles of any modality; duplicate articles; end of course work such as: monographs, dissertations and theses and international studies.

The articles were analyzed in full by four researchers and the extracted data were presented in a descriptive manner, in order to communicate to the readers knowledge of the main types of studies involving abuse and violence against the elderly in Brazil in the last five years. The theoretical references of previously published studies with the theme proposed by the authors were used to analyze the results obtained.

In order to organize and tabulate the results, the data collection instrument used and elaborated by the authors included characteristics such as: year of publication, main journals, research design, topics covered, main areas of knowledge, sampling and objectives to be described in the results and discussion sections.

RESULTS AND DISCUSSION

From the descriptors used, 121 articles were identified in the VHL, annexed to the databases: LILACS, SCIELO and CAPES. Most were found in the LILACS database (67 articles).

After analyzing and strictly following the inclusion and exclusion criteria, described in the methodology above, 28 articles on elder abuse were selected, published in Brazilian journals from 2013 to 2017. During the analysis, a prevalence of cross-sectional and descriptive articles was observed, with most published in 2016 (n = 9) and 2015 (n = 8). All the studies are described in (Table 1), according to the year of publication, the proposed objectives, the chosen research design and the sample size.

After analyzing the period established for the research, it was noted that despite the importance of the theme, studies related to violence against the elderly are not numerous (n = 28). Even four decades after the first publication on the subject, violence against the elderly remains a veiled paradigm in scientific productions and public affairs[6]. Such a phenomenon may be related to the difficulty in working with the theme, recognizing it or by the difficulty of directly approaching the victims.

In terms of the studies and periodicals analyzed (Table 2), there was a predominance of studies in the areas of Nursing (n=12), Collective Health (n=7) and Psychology (n=6), the majority of which were published in journals specific to gerontology and nursing. The main publications were the *Revista Brasileira de Geriatria e Gerontologia* (the Brazilian Journal of Geriatrics and Gerontology) (n=5) and the Journal of Nursing - UFPE (n=4). These data are in line with the results of another integrative review that addressed the same theme, carried out in 2013, but differed in relation to the increase in the number of articles in the areas of psychology and collection health and a reduction in the number of public health journals[41]. Journals specific to gerontology have increased since the integrative review on abuse published in 2013[42].

Although the topic is considered a public health issue, only one article was published in a periodical focused on this area. The question therefore arises: is the scarcity of articles in health journals related to a lack of interest in the topic or the difficulty of performing and publishing articles in this area? There is therefore a need for greater investment in public health research to prevent elderly persons from continuing to suffer violence in silence.

Table 1. Profile of studies (N=28) of elder abuse carried out between 2013 and 2017. Campinas, São Paulo, 2017.

Author(s) Year of publication	Study design	N	Objectives	Research area
Araújo, L. F.; Cruz, E. A. e Rocha, R. A. (2013)[14]	*Ex-post facto,* cross-sectional type	100 individuals (50 community health agents and 50 health professionals)	To identify and compare the social representations of violence in old age among community health agents and health professionals included in the family health strategy.	Psychology
Santos, C. M., et al. (2013)[15]	Document analysis	2,304 complaints between 2004 and 2006	Assess the prevalence of elder abuse and analyze the database of reported lesions that could be identified.	Dentistry
Wanderbroocke, A. C. N. S. and Moré, C. L. O. O. (2013)[16]	Cross-sectional and qualitative	10 health professionals	Describe the professional approach to family violence against the elderly in a basic health unit (BHU).	Collective Health
Faustino, A. M., Gandolfi, L. and Moura, L. B. A. (2014)[17]	Cross-sectional population-based study	237 elderly persons	To verify if there is a relationship between the functional capacity of the elderly and the presence of situations of violence in their daily lives.	Nursing
Gonçalves, J. R. L., et al. (2014)[18]	Descriptive study with a qualitative approach.	12 health professionals	To identify the perception of health professionals about domestic violence against the elderly and to understand the conduct of domestic violence situations.	Nursing
Maia, R. S. and Maia, E. M. C. (2014)[19]	Transcultural adaptation	15 elderly persons	Promote the transcultural adaptation of VASS for Brazil.	Psychology
Pereira, J. K., Firmo, J. O. and Giacomin, K. C. (2014)[20]	Qualitative anthropological study	57 elderly persons	To investigate the elements involved in the construction of the meanings of disability for elderly residents of the city of Bambuí, Minas Gerais, Brazil.	Collective Health
Sales, S. D., et al. (2014)[21]	Exploratory and descriptive study with a qualitative approach	135 to 165 relatives of elderly persons, five of whom were the agents evaluated.	To identify the perception of community health agents (CHA) in relation to elderly victims of violence and analyze the flow of care of the cases of violence against the elderly identified by CHA.	Nursing
Aguiar, et al. (2015)[22]	Descriptive study	112 Incident reports	Describe cases of violence against the elderly in the municipal region of Aracaju, Sergipe, Brazil.	Nursing
Minayo, M. C. S., et al. (2015)[23]	Evaluative, quantitative and qualitative study	18 Integrated Centers for Attention and Prevention of Violence against the Elderly (CIAPVI)	"Lessons Learned" in the process of evaluation and monitoring of centers for the prevention of violence against the elderly, a program created in 2007 by the Human Rights Secretariat of the Presidency of the Republic (SDH).	Collective Health
Musse, J. O. and Rios, M. H. E. (2015)[24]	Qualitative, descriptive and exploratory	17 nurses	To identify the performance of nurses when dealing with domestic violence against the elderly.	Nursing
Paiva, M. M. and Tavares, D. M. S. (2015)[25]	Home-based enquiry	729 elderly persons	To verify the prevalence and factors associated with physical and psychological violence against the elderly and trace the sociodemographic and clinical indicators.	Nursing

to be continued

Continuation of Table 1

Author(s) Year of publication	Study design	N	Objectives	Research area
Paraíba, P. M. F. and Silva, M. C. M. (2015)[26]	Descriptive cross-sectional study	242 notifications of violence	Describe the profile of violence against the elderly in the city of Recife, Pernambuco, Brazil.	Collective Health
Rodrigues, C. L., Armond, J. E. and Gorios, C. (2015)[27]	Cross-sectional; quantitative; descriptive and retrospective	602 cases of elderly persons	Characterize the population of elderly persons who have suffered physical and sexual violence and describe the characteristics of this aggression.	Public and Mental Health
Silva, E. A. e França, L. H. F. P. (2015)[28]	Quantitative and predictive study	284 Elderly persons	Examine the factors that influenced violence against the elderly in the city of Rio de Janeiro, Rio de Janeiro, Brazil.	Psychology
Trindade, R. F. C., et al. (2015)[29]	Ecological study	634 deaths from firearm projectiles	Describe the profile of victims of armed robbery resulting in death.	Nursing
Bolsoni, C. C., et al. (2016)[30]	Populational base	1,705 individuals	Estimate the prevalence of violence against the elderly and analyze its association with demographic, and socioeconomic factors and health conditions.	Collective Health
Damasceno, C. K. C. S., Sousa, C. M. M. and Moura, M. E. B. (2016)[31]	Explorative study with a qualitative approach	300 police incident reports	Analyze cases of violence against the elderly registered in a police station for the security and protection of the elderly.	Nursing
Faustino, A. M., Moura, L. B. A. and Gandolfi, L. (2016)[32]	Cross-sectional population based study	237 elderly persons	To determine if there was a relationship between the cognitive capacity of elderly persons and exposure to situations of violence.	Nursing
Garbin, C. A. S., et al. (2016)[33]	Cross-sectional; descriptive; retrospective document analysis study	572 police incident reports	To verify the occurrence of elder abuse and its characteristics based on the police records over a five year period.	Dentistry
Guimarães, D. B. O., et al. (2016)[34]	Observational; descriptive and retrospective study	225 police reports	Characterize elderly victims of violence.	Nursing
Irigaray, T. Q., et al. (2016)[35]	Document analysis	224 police incident reports	Verify the prevalence and types of abuse suffered by the elderly, registered at a Police Station for the Protection of the Elderly in the municipal region of Porto Alegre, Rio Grande do Sul, Brazil.	Psychology
Maia, R. S. e Maia, E. M. C. (2016)[36]	Cross-sectional and analytical study	66 individuals	To present preliminary psychometric evidence of the cross-cultural adaptation of the Vulnerability Abuse Screening Scale (VASS).	Psychology
Moreira, W. C., et al. (2016)[37]	Descriptive theoretical-reflexive study	-----	Abuse, the elderly and public policies.	Nursing

to be continued

Continuation of Table 1

Author(s) Year of publication	Study design	N	Objectives	Research area
Silva, C. F. S. and Dias, C. M. S. B. (2016)[38]	Descriptive study	13 individuals	Investigate violence against elderly persons in the family, from the perspective of the aggressor, specifically in terms of the motivations that impelled them to act violently and the feelings and needs felt by them.	Psychology
Avanci, J. Q., Pinto, L. W. and Assis, S. G. (2017)[39]	Cross-sectional	36 elderly persons	To analyze data on intrafamily violence witnessed by the emergency services according to the sociodemographic characteristics of the people receiving care, the act itself and the evolution of care, from childhood to old age by gender; and the factors that differentiate occurrences of intra-family violence from violence committed by non-relatives.	Public Health
Dantas, R. B., Oliveira, G. L. e Silveira, A. M. (2017)[40]	Adaptation and validation of scale	151 Elderly persons	Adapt and evaluate the psychometric properties of the Vulnerability to Abuse Screening Scale – VASS.	Medicine
Rodrigues, R. A. P., et al. (2017)[41]	Ecological, historical series type	2,612 police incident reports	To analyze the incident reports involving elderly persons who suffered violence in order to identify socio-demographic characteristics of victims and aggressors, type of violence, location, as well as comparing rates in three Brazilian municipalities from 2009 to 2013.	Nursing

Table 2. Distribution of articles on elder abuse between 2013 and 2017, by journal. Campinas, São Paulo, 2017.

Journal	N (%)
Revista Brasileira de Geriatria e Gerontologia (Brazilian Journal of Geriatrics and Gerontology)	5 (17.85%)
Journal of Nursing – UFPE On Line (JNUOL)	4 (14.28%)
Ciência & Saúde Coletiva (Science and Public Health)	2 (7.14%)
Caderno de Saúde Pública (Reports Public Health)	2 (7.14%)
Revista Brasileira de Enfermagem (Brazilian Journal of Nursing)	2 (7.14%)
Estudos Interdisciplinares sobre o Envelhecimento (Interdisciplinary Studies on Aging)	2 (7.14%)
Estudos de Psicologia (Studies on Psychology)	2 (7.14%)
Other journals	9 (32.13%)
Total	28 (100%)

The results obtained from the analysis of these studies indicated that the main objectives proposed in the investigations were: analyze and describe the main types and prevalence of elder abuse (36%), categorize the profile of the victim and the aggressor (24%), analyze the consequences for the health of the victim (20%), adapt and validate scales of evaluating abuse (12%) and works on public policies and prevention (8%).

The content of the studies was limited to identifying the profile of the victims, as well as the prevalence of types of abuse. However, there are few studies that sought to identify the main motivations of the aggressor, intervention studies with health teams, proposals for innovation and strategies for prevention and diagnosis. Studies that specifically addressed other types of violence, such as discrimination and institutional, social and economic

violence are non-existent. Elderly persons often suffer financial abuse, such as theft, committed mainly by banking and health agencies and commercial establishments[43]. No research that attempted to understand this phenomenon was found, not even in relation to the frequency of occurrence, resulting in greater concealment of the problem.

Studies that carried out investigations directly with the victims were rare[25,28,30,32,39]. The main approaches used in the investigations were document analysis and data collection from incident reports available at police stations. This may be associated with the difficulty in approaching victims of violence, as the elderly do not generally report the abuses and aggressions they suffer due to embarrassment and fear of repression by their caregivers, who are often the aggressors[11].

Of the elderly who suffered aggression, the majority were women (64%). This result agrees with another integrative review study on elder abuse, conducted in 2013, which identified a greater female presence among cases of violence against persons aged 60 years or older[42]. The study conducted by Rodrigues et al.[42] found higher rates of aggression against women (94.74%) aged over 60, 28.94% of whom reported verbal abuse, 13.15% of whom suffered physical aggression and 39.47% of whom experienced family neglect.

The main types of violence found in the present review were: psychological (28%), physical (28%), financial (12%), other types of violence (12%) or not described (20%). The study by Rizzieri and Barbosa[43], undertaken in a basic health unit in the primary health care system, found that psychological violence was most common, followed by physical and financial violence[43].

Another factor observed was the proximity between the victim and the aggressor. The violence was often committed by the sons or daughters of the victim (28%), and the majority of the occurrences of violence took place in the residence of the elderly person (60%). Among the reasons for the proximity of the aggressor is the family context, which is often stressful and includes the presence of unprepared or overburdened caregivers.

The descriptive document analysis carried out in the municipal region of Sergipe found that of the 112 incident reports analyzed, 96,4% of the cases of violence occurred in the home. The majority of the victims were widowed, while most aggressors were male (74.1%) and the children of the victims[44].

This phenomenon can be explained by the fact that elderly persons with limited independence require constant interaction with a caregiver to perform the necessary and basic tasks of day to day living[45]. Elderly persons in a situation of dependency receive, in most cases, care in the family environment, as this is the main institution responsible for promoting the care of family members, as recognized and guaranteed in the Statute of the Elderly[46]. Although the family is the nucleus of support, it is not always able to meet all the needs that this group demands [46].

Providing care for dependent elderly persons at home requires changes and adjustments in the lifestyle of caregivers, including a need to reconcile personal, professional and domestic tasks; a reduction in family income due to treatment and the purchase of medicines; family reorganization and the suitability of the home for the needs of care. The family begins to revolve around the demands that the role of being a caregiver imposes. This can sometimes make the task of caring a negative experience, capable of triggering physical and emotional exhaustion, and resulting in a variety of almost always harmful consequences for the life and health of the caregiver. The burdened caregiver, in turn, can threaten family balance and relationships and may be a risk factor for the abuse of their elderly relatives[46]. Queiroz et al.[47] carried out a study with caregivers of elderly persons, in order to verify the factors associated with neglect among this group. For the authors, the primary factor for neglect is the burden of the caregiver caused by the greater functional dependence of the elderly[47].

Family members generally assume the role of caretakers of their elderly relatives voluntarily and informally, and are often unprepared for this role. The lack of knowledge and clarification of the aging process and the changes it entails means the task of caring is carried out intuitively and often in an incorrect manner. As a consequence, situations of neglect and abandonment can occur[35].

Other factors related to the high prevalence of elder abuse in a family context should be considered, such as the lack of formal and informal support for caregivers, public policies or public support for families with dependent elderly persons, such as public day centers that could help families in a situation of care, reducing the burden and responsibilities of family members and their impact upon the individual. Deprived families, especially those lacking social and financial resources, are more likely to feel more overburdened and unprepared to care for their elderly relatives, since the task of caring requires a variety of resources, including emotional, physical and economic[48].

It can then be concluded that many cases of abuse could be avoided if there was greater intervention and more educational actions aimed at the relatives and caregivers of elderly persons.

One of the limitations of the present study was the fact that most of the studies used data from police incident reports, which may not reflect the reality experienced by the elderly population suffering violence or their relatives. We suggest that further studies are undertaken with a broader scope, encompassing other types of issues, not only the subject of violence in the family environment, directly involving elderly persons in the community and not taking data from incident reports, in order to gain more knowledge of the subject and devise more effective prevention and intervention strategies.

CONCLUSION

The present integrative review found that the main forms of violence suffered are psychological and physical, with elderly women the main victims and the home the main location for abuse. The main reasons for aggression were not clarified. The increase in the aggression and abuse of elderly persons found in our research over the last five years is apparent, but little information is provided about the reasons that led the aggressor to carrying out the act, making new studies that seek to identify these factors necessary.

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